

THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

CEMENT • SAND AND GRAVEL • CRUSHED STONE • SLAG • LIME • GYPSUM
READY-MIXED CONCRETE • CONCRETE PRODUCTS • INDUSTRIAL MINERALS

FEBRUARY 1945

The Library of
Congress
Serial Record

FEB 19 1945

COPYRIGHT DEPOSIT.

FEB 19 1945

CONVENTIONS "IN PRINT"

SAND & GRAVEL
READY MIXED CONCRETE

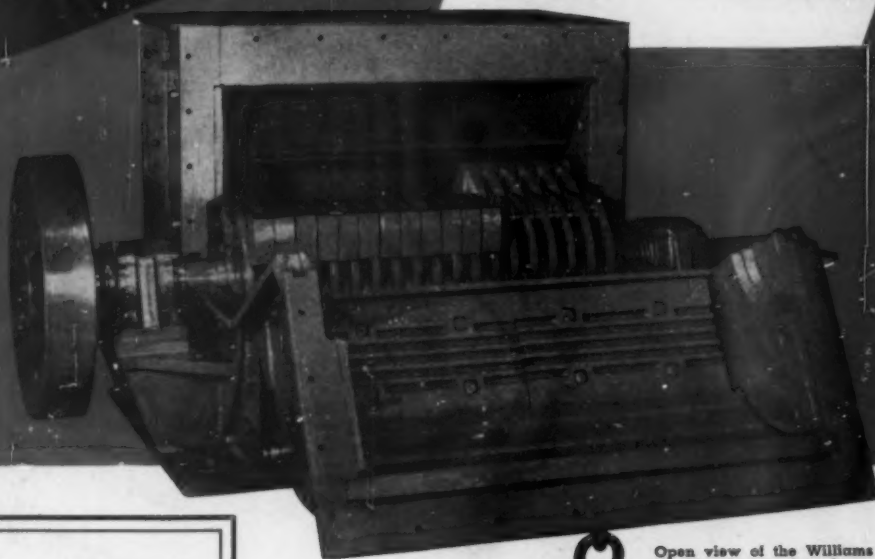
ODER EXPRESS HIGHWAY IN NEW YORK

ment
n of
and
Rich
will
ating
arge

FEB 17 1945

**DESIGNED
ESPECIALLY FOR
AGSTONE**

**WILLIAMS
"NF" HAMMER
CRUSHER**



Open view of the Williams "NF" Mill showing heavy duty hammers, grinding plates, side liners and cover liners. Also shows easy accessibility to mill for repairs, etc.

FEATURES OF THE "N F"

- Adjustable grinding plate.
- Hammers adjustable to overcome wear.
- Larger capacities.
- Lifetime construction.
- 2" top liners, 1" side liners.
- Easy to work on—hinged cover.

The Williams "NF" Hammer Crusher was designed especially for reducing 4" or smaller stone to $\frac{3}{4}$ ", $\frac{1}{2}$ " or agricultural limestone. Embodies all the outstanding features Williams has developed in hammer mill design and construction and has proved itself an outstanding performer in the field.

The "NF" is built in a large range of sizes with capacities from 9 to 35 tons per hour when making agricultural limestone, affording a size mill for any job. Its principles of operation—a combination crushing and grinding—enables it to make agstone that meets rigid size specifications at a good margin of profit to producers.

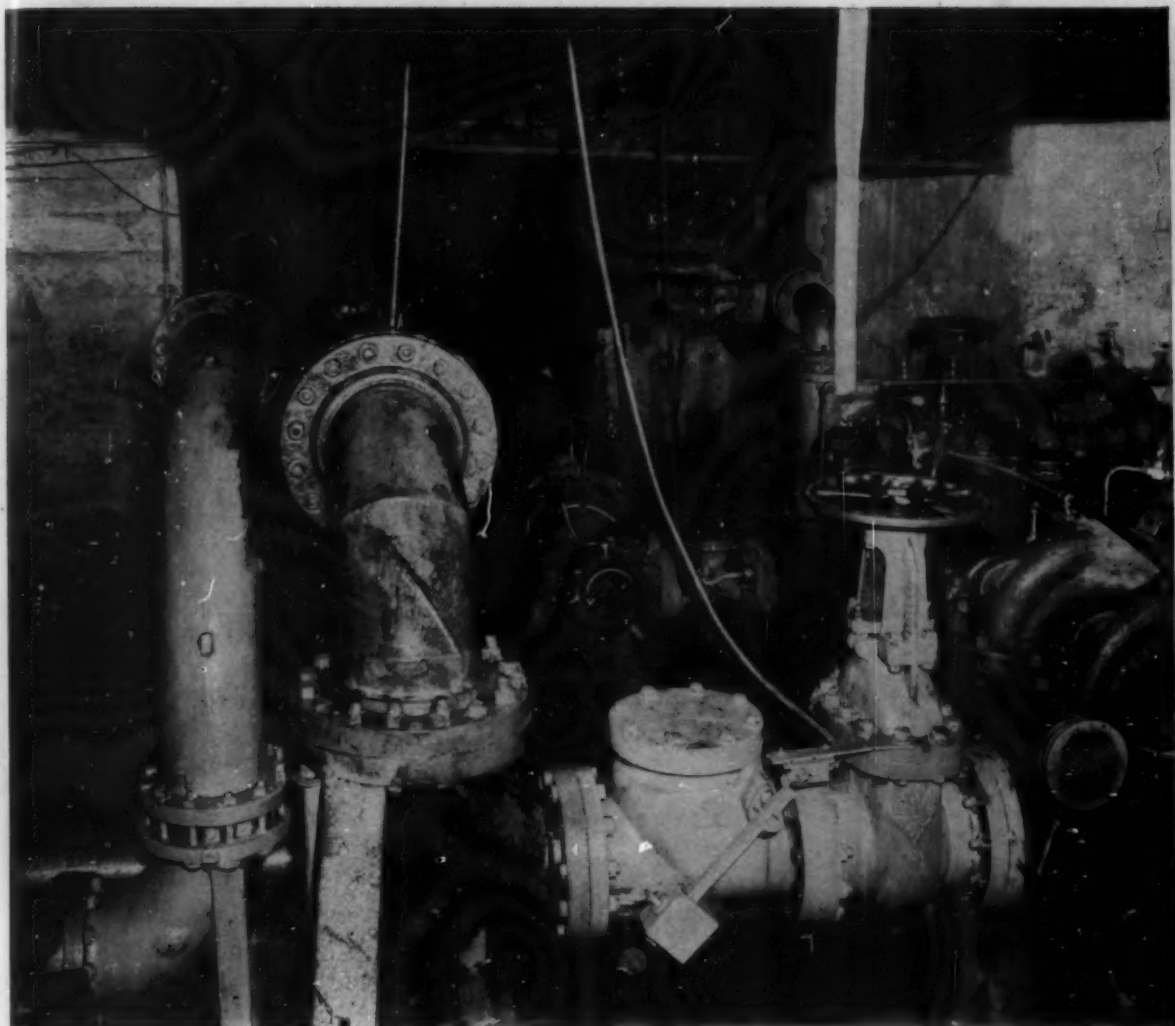
"We appreciate your inquiries—write today for additional information—no obligation on your part."

**WILLIAMS PATENT CRUSHER
& PULVERIZER COMPANY**

800 ST. LOUIS AVENUE
ST. LOUIS, MO.



WILLIAMS
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD
WILLIAMS
PATENT CRUSHERS GRINDERS SHREDDERS



Pipes gulp acid water to save a coal mine

A typical example of B. F. Goodrich development in rubber

AT THIS mine in Maryland there's a good coal—450 feet down—but even more water. A few years ago they almost lost the mine—the pipes, for pumping the water out, had corroded, because the water contains acid, and in three days enough water could pour in to flood the underground pumps and lose the mine for months—make salvage almost impossible.

The mine owner had heard that chemical plants use pipe lined with B. F. Goodrich rubber to handle strong

acids. He investigated, bought the same pipe, and has never been in danger of losing his mine since. Metal pipe used to last 7 months; the B. F. Goodrich pipe has now been in use 48 months and is as good as new. In that time it has handled more than 10 billion gallons of acid water.

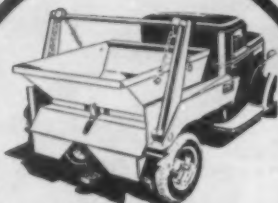
Many B. F. Goodrich developments, made for one industry, are applied as this was to an entirely different field with equally good results. Research is continuous at B. F. Goodrich, and applies to every kind of rubber product,

new or old. No product is too standardized to be improved or changed to meet changing needs of users. B. F. Goodrich distributors can tell you about those improvements in products your company already uses or *might* use. If you don't know the name of the distributor nearest you, write direct about any problem you have that rubber might solve. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B. F. Goodrich
FIRST IN RUBBER

Brooks LOAD LUGGER

Trade Mark Registered



Here's the Answer to Your Material Handling Problems

You can save time, conserve manpower and use your trucks to better advantage by equipping them with LOAD LUGGERS. The Brooks multiple-bucket-system is the economical way to do such jobs as:—

- Stripping overburden
- Feeding rock crushers
- Road building
- Snow removal
- Quarrying operations
- Loading riprap on cars

For details, see Catalog No. 44.



For maximum truck efficiency: Use 5 to 10 detachable buckets with each Load Lugger unit.

Tilt-type, Skip-type and special Enclosed Type Buckets available in various capacities.

Ask about the Truc Krane boom attachment for use with Load Lugger unit.

402 Davenport Rd.
Distributors in All
Principal Cities

Brooks

EQUIPMENT & MFG. CO.
KNOXVILLE, TENNESSEE



In This Issue



A Challenge to Industry	Bror Nordberg	47
Washington News		49
Rocky's Notes		51
News About the Industry and People		53
Sand Recovery	Nathan C. Rockwood	57
Hints and Helps		58
New Machinery		60
Boiler Revamping and Expansion Program		
Dewey Portland Cement Co., Dewey, Okla., adds new waste heat boiler, and relocates raw mills, blending tanks, etc., in improvement program	C. E. Kietzman	62
Two-Shift Operation Cuts Costs		
Blue Diamond Corporation excavates sand and gravel at night, and moves material to plant during the day	Jim Medford	65
"Convention in Print"		
Reports and addresses presented before recent Directors' Meetings of the National Sand and Gravel Association		67
Phosphate Production Problems		
Article IV: Drying and grinding; general arrangement	Otto H. Wustrack	82
Efficiency Through Job Evaluation		
Actual measurements to determine standards for specific quarry operations govern wage incentive plan		86
High Production in Small Plant		
Rocky Ford Limestone Co., Lincoln, Ill., adds new crushing and screening capacity to step up agstone production	H. E. Swanson	90
Charts Reduce Laboratory Calculations		
Determination of cement slurry moisture and fineness, coal moisture, and flue gas analysis has been simplified by the use of charts	C. J. Knickerbocker	94
Road Builders Meet in Chicago		106
Vibrecast Concrete Products		
Careful gradation of aggregates, rigid control of concrete consistencies, and determination of proper vibration are essential	M. W. Loving	109
Vermiculite Insulating Concrete		
Lightweight concrete of vermiculite aggregate has many industrial applications in precast shapes	H. K. Lange	114
Oklahoma Minerals Industry Conference		120

Rock Products is published monthly by Trade Press Publishing Corporation, 309 West Jackson Blvd., Chicago 6, Illinois; Horace T. Hunter, President; John R. Thompson, Vice-President and General Manager; J. L. Frazier, Secretary. Copyrighted 1944. Entered as second-class matter, Jan. 30, 1936, at the Chicago, Ill., post office under the act of March 3, 1879.

SUBSCRIPTION INFORMATION

Subscription Price: United States and Possessions,

Mexico, Cuba, Canada, \$2.00; and \$4.00 foreign countries. Twenty-five cents for single copies. Indexed in the Industrial Arts Index.

Canadian Subscriptions and remittances may be sent in Canadian funds to ROCK PRODUCTS, P. O. Box 100, Terminal "A," Toronto, Canada. To Subscribers—Date on wrapper indicates issue with which your subscription expires. In writing to have address changed, give old as well as new address.

Charles Hoefler, Jr., Manager

L. V. Rodda, Circulation Manager

C. F. Teats, Field Representative

C. M. Hancock, Production Manager

M. M. Myers, Art Director

F. J. Richier, Director of Research

DISTRICT ADVERTISING OFFICES:

EASTERN AREA—E. H. St. Jules, Manager, 522 Fifth Ave., New York 18. Tel. Murray Hill 2-7888.

CENTRAL AREA—T. O. Steadman, Manager, 648 Hanna Bldg., Cleveland 15. Tel. Main 4362.

MIDWESTERN AREA—J. J. O'Neill, Manager, 309 W. Jackson Blvd., Chicago 6. Tel. Harrison 7890.

WESTERN AREA—L. C. Thoen, Manager, 309 W. Jackson Blvd., Chicago 6. Tel. Harrison 7890.

PACIFIC AREA—Duncan Scott & Co., Mills Bldg., San Francisco 4. Tel. Sutter 1395. In Los Angeles 13, 408 Pershing Square Bldg. Tel. Michigan 0921.

LONDON, ENGLAND—Geo. J. Jessup, Manager, 57 Goldsmith Ave., Acton, W. 3.

Lorains are **LONG ON POWER**

—And Short on Shock!

NO job is too tough for a 2 yd. Lorain 82—the real rock shovel. This husky machine has plenty of power and extra rugged construction—but it has something even more valuable for rock work. And that's a life-saving shock absorber in the form of a hydraulic coupling!

This heavy-duty fluid coupling provides a perfect cushion between the engine and the load—eases strain on

cables, boom and power transmission—increases machine life and cuts operator fatigue immeasurably. You'll never stall a Lorain 82 engine in rock or anything else.

Look into this real rock shovel now! You'll like the all-welded, all-steel boom; the center chain drive crawler and the all-steel dipper stick, too. Send for catalogs today.

LORAIN, OHIO

THE THEW SHOVEL COMPANY

Reg. Trade Mark
thew Lorain

SHOVELS

CRANES • DRAGLINES • MOTO-CRANES

**Whiterock
Mountain Quarry
Company Uses
TIMKEN BITS**

Exclusively

**they have
found it
PAYS**



Perched atop Whiterock Mountain in Powell County, Kentucky, this quarry produces a hard white limestone high in calcium carbonate, low in silica and magnesium; a tough subject for drilling.

Production averages 800 tons per 10 hour day and the entire output is used for road construction and agricultural lime. All drilling is done with Timken Side Hole Cross Bits and wagon drills. Drilling depth, 12 feet to 28 feet; drilling speed, approximately 1 foot per minute per drill.

The quarry is owned and operated by A. W. Walker & Son, of Danville, Kentucky,

road contractors, who have used Timken Bits exclusively for more than 11 years. They have found it pays.

Are you using Timken Rock Bits? If not you are overlooking an opportunity to drill more holes per day or per shift at lower cost per hole. Write for name of nearest authorized distributor. The Timken Roller Bearing Company, Canton 6, Ohio.



This CRAWLER is DIFFERENT!

It is one of the many exclusive features that make the Northwest a better shovel for the mine, quarry and pit—one of the features that make it a *real Rock Shovel*.

Steering is fully controlled from the cab (regardless of its position) and when equipped with Differential Steering, positive traction is maintained on both crawlers while turning, as well as when going straight ahead, making it possible for Northwests to maneuver over rough pit floors that give other crawlers difficulty.

All gears are fully enclosed and protected and small crawler rollers prevent the jamming up of treads as sometimes occurs with large crawler rollers when traveling over rails, rocks, timbers or other similar obstructions.

Let's get acquainted! There are lots of other features that make Northwests a better shovel for the mine. We'd like to have you know more about them. Let us send you complete details on the size machine that will fit your future plans.

Quick shovel information for the man that O.K.'s the purchase of shovels.

NORTHWEST ENGINEERING COMPANY

1806 Steger Building

28 East Jackson Boulevard

Chicago 4, Illinois

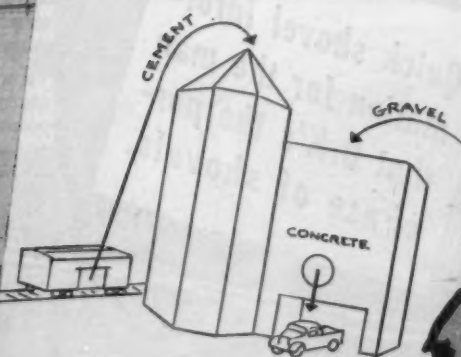
*If it's a
real Rock Shovel
you won't have
to worry about
output in dirt*

NORTHWEST

At the left, S-A Bucket Elevator handles bulk cement from box cars and storage bin. At the right, is the S-A Belt Conveyor equipped with PACIFIC Type Carriers.

The Problems

- ① To unload bulk cement from box cars and elevate to storage bin.
- ② To convey gravel from hopper to ready-mix plant.



THE SOLUTION: THE *Right* COMBINATION OF THE *Right* EQUIPMENT

To combine the exact handling equipment needed into an engineered layout, is a job that calls for skill, experience . . . and access to the right units. It is because Stephens-Adamson engineers have those qualities, that they can design efficient systems like the one shown here.

At one side of this ready-mix concrete

plant, bulk cement is unloaded from box cars with an S-A Power Shovel into a car door hopper which feeds an S-A Bucket Elevator. At the other side, gravel of various sizes is moved, via S-A Belt Conveyor, up an 18° incline to the storage bin. Both handling operations are being performed with the speed and at the low costs that spell high efficiency.

STEPHENS-ADAMSON
7 RIDGEWAY AVENUE, AURORA, ILLINOIS MFG. CO. LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

Designers and Manufacturers of All Types of

THE
R
feeder
the fir
capacity
let in N

Gyrator
Jaw
Reduction
Crush
Grind
Ball
Tub
Roc
Gr

NE
3416 E

Export

Reduction Crushers



OVER 400

IN SATISFACTORY OPERATION



THE TY Crusher is fitted with Non-Choking Bell Shaped Heads and Concaves, which accounts for the many crushers in operation, crushing practically every known type of ore and rock.

Non-Choking means no packing, with resultant large capacity and minimum horsepower. Built in sizes to meet any requirements. Bulletin No. 3112.

FINER CRUSHING WITH MULTI-STAGE CRUSHERS

THE Multi-Stage Crusher is a combination of two Reduction Crushers. The first stage acts as a feeder and preliminary crusher. The second stage does the final crushing without packing. Result: large capacity to fine setting with minimum horsepower. Bulletin No. 1113.

WE BUILD

Gyratory Crushers
Jaw Crushers
Reduction Crushers
Crushing Rolls
Grinding Rolls
Ball Mills
Tube Mills
Rod Mills
Grizzlies

Feeders
Classifiers
Samplers
Jigs
Furnaces
Settlers
Crucibles
Forehearths
Converters

Casting Machines
Accessories
Complete Milling
and Smelting
Plants
Rotary Kilns
Rotary Coolers
Rotary Dryers



TRAYLOR

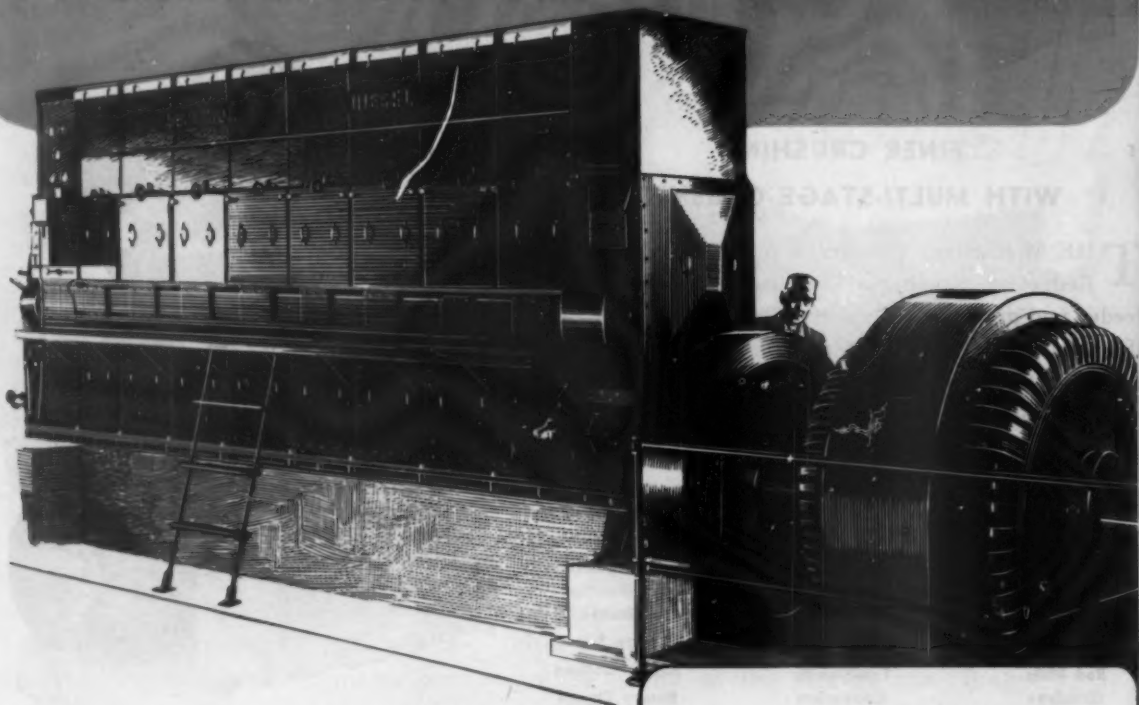
ENGINEERING & MANUFACTURING CO.
MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

NEW YORK CITY 3416 Empire State Bldg.	CHICAGO 2061 One La Salle St. Bldg.	SALT LAKE CITY 101 West Second South St. B. C. EQUIPMENT CO., LTD. 551 Howe St., Vancouver, B. C.	LOS ANGELES 919 Chester Williams Bldg.	SPOKANE S. 2707 Rhyolite Rd.
---	---	--	--	--

Export Department—104 Pearl St., New York City, Foreign Sales Agencies: London, Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro, Montevideo, La Paz



Industry can
Trust the Time Honored
Dependability
of *Superior* Diesel



Superior
ENGINES

Division of
THE NATIONAL SUPPLY CO.

General Sales Office:
Springfield, Ohio

SUPERIOR DIESELS • STATIONARY, 28 to 1325 H. P.
MARINE, 28 to 1325 H. P. • GENERATOR SETS, 20 to 928 kw.

CA

NOV
G
will say
drives
the per
test set
types o
(Goody
formati

In it yo
steel-ca
at belt
as fast a
in place
in some
ciency.
belts—
withstan
severe o
it gives
ultimate

Those a
sons w
MILL
tionary
stando

7



NO OTHER V-BELT CAN MATCH THESE RECORDS!

NOW you can see advance proof that Goodyear's great steel-cable V-Belt will save real money on your toughest drives that "eat up" ordinary belts. It's the performance data on more than 2,000 test sets of this super-tough belt on all types of drives—compiled by the G.T.M. (Goodyear Technical Man) for your information.

In it you'll see evidence that the Goodyear steel-cable V-Belt is successfully operating at belt speeds as slow as 38 F.P.M.—and as fast as 9,400 F.P.M. That it can be used in place of chain-drives, gears or flat belts, in some applications, with far greater efficiency. That it long outlasts conventional belts—that it doesn't stretch—that it withstands heat, shock loads and other severe operating hazards far better. That it gives superior service at lowest ultimate cost!

Those are just a few of the reasons why more than **TWO MILLION** of these revolutionary belts are now giving standout service on "killer"

drives—both in war plants and on military equipment. Once you have tried them, you will want them on every tough V-drive. To bring the G.T.M. to your office with these convincing records, write Goodyear, Akron 16, Ohio, or Los Angeles 54, California—or phone the nearest Goodyear Industrial Rubber Products Distributor.

E.C. Cord—T.M. The Goodyear Tire & Rubber Company

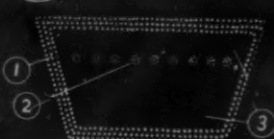
ASK YOUR
G.T.M.
TO SHOW YOU
THIS SERVICE

DATA BOOK ON
**GOODYEAR
STEEL-CABLE
V-BELTS**

GOODYEAR INDUSTRIAL RUBBER PRODUCTS



-Specified STEEL-CABLE V-BELT for Multi-V drives



1. Heavy, super-tough black cover with uniform friction, longer life
2. Load-carrying, endless, steel cables in neutral plane
3. Tension and compression section of high-quality rubber

GOODYEAR
THE GREATEST NAME IN RUBBER

P.S. For longest wear in cotton cord V-belts, specify Goodyear E. C. Cord Belts.

Here's the 1945 Picture

To give you more
tonnage... at lower
cost, Allis-Chalmers
has built these
6 important features
into the
Type "R" Crusher..



FOR VICTORY

FOR PEACE

**BASIC EQUIPMENT
FOR CRUSHING & MINING INDUSTRIES:**

ALLIS

Jaw, Gyratory, Hammer & Roll
Crushers, Ball & Rod Mills

Kilns, Coolers,
Roasters, Dryers

Vibrating
Feeders

e of Crusher Value...

1 RECESSED SPIDER CAP reduces wear, assures a more uniform distribution of feed to crushing chamber.

2 CRUSHING SURFACE is a 1-piece ring... held in place by a unique self-locking device that saves time, expense—eliminates need for costly zincing.

3 EXCLUSIVE "SPEED-SET CONTROL" permits quick change of product size without stopping crusher... at the simple, almost effortless turn of a crank. Result: close, instant product control. Also enables fast unloading of crusher in case of power failure... cutting down expensive outage time.

4 CRUSHING CHAMBER is scientifically designed to assure continuous high capacity... a more uniform product.

5 GRAVITY-TYPE dust seal guards internal working parts against entrance of dust, dirt, etc.

6 BY LOWERING crushing head and permitting foreign material to pass through crusher, this automatic relief valve affords protection against damage by reasonable size tramp iron, bolts, nuts, drill bits, etc.

YES, AND TO THOSE 6 features above you can add... ease of installation and operation... a lower maintenance expense... the fact that you can actually buy the modern Type "R" Crusher for less money than is asked for most comparable crushers! Get the complete story today — from our nearby district office. Or write for Bulletin B6006. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

♪ Tune in the Boston Symphony, Blue Network, every Sat. Eve.

A 1789-A

CHALMERS

Vibrating & Revolving Screens,
Feeders, Conveyors, Hoists

Washers, Scrubbers, Blade
Mills, Centrifugal Pumps

Tractors, Gasoline
Power Units, etc.

Motors, Texrope Drives,
Power Equipment

Now is the time to Order REPLACEMENT PARTS for your Rotary Kilns.

Most Economists agree that post-war demands for peace-time products will far exceed all previous figures and that manufacturers should take full advantage of all intervening opportunities to recondition their equipment. If you operate Rotary Kilns, Coolers, Dryers, Retorts, etc., you are invited, accordingly, to write us NOW regarding any necessary repairs or replacements. The sooner your order is placed the sooner and better we will be able to serve you.

If your requirements involve engineering service remember that Vulcan has been designing and manufacturing this class of equipment for nearly fifty years. This long experience, backed by unsurpassed foundry and machining facilities for this type of work, often enables our engineers to make helpful suggestions and ALWAYS constitutes your best possible guarantee of satisfactory results. Preliminary designs and estimates furnished promptly without charge or obligation.

VULCAN IRON WORKS

Established 1845

Main Office and Works **WILKES-BARRE, PA.,** New York Office 50 Church

Rotary Kilns, Coolers and Dryers
Rotary Retorts, Calciners, Etc.
Improved Vertical Lime Kilns
Automatic Quick-Lime Hydrators

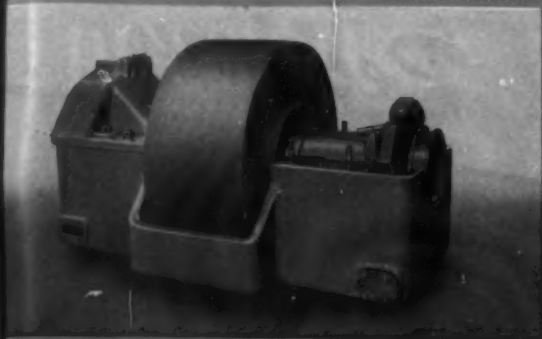
Toothed, Double-Roll Crushers
High-Speed Hammer-Type Pulverizers
Ball, Rod and Tube Mills
Shaking-Chute and Chain Conveyors

Heavy-Duty Electric Hoists
Self-Contained Electric Hoists
Scraper-Loading Hoists
Cast Steel Sheaves and Gears

Steam Locomotives
Diesel and Gasoline Locomotives
Diesel-Electric Locomotives
Electric Locomotives and Locomotives

Vulcan Welded Kiln-Shell Section ready for shipment. Shells or shell sections can be of any diameter up to the limit of railroad clearances. Unless otherwise specified all longitudinal joints are automatically welded. Intermediate circular joints are usually U-grooved and electrically welded, with suitable outside reinforcements.

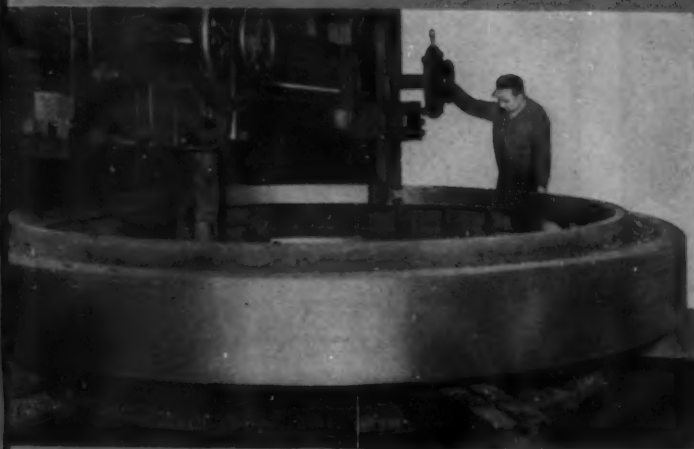




Vulcan Supporting-Roller Assembly with one bearing cap removed to show oiling bucket and oil trough. Journal bearings are full 180-degree bushings at right angles to direction of pressure. Roller is .40 to .50 carbon steel, cast in our own steel foundry and shrunk on forged-steel shaft.

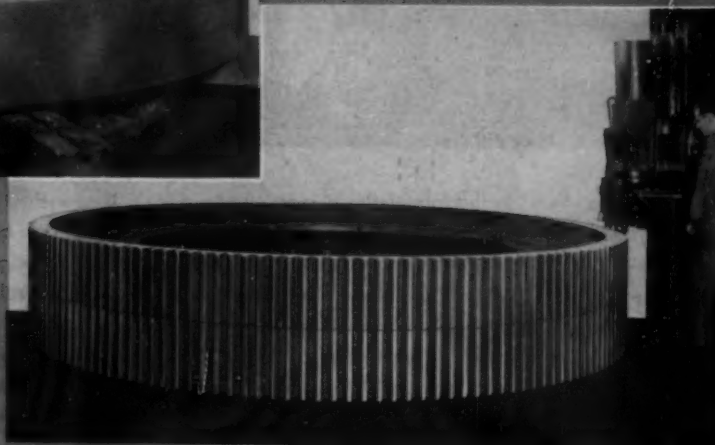


Complete assembly of latest-type Vulcan Supporting Roller Bearings and Thrust Bearings. We are equally prepared to furnish replacement parts or complete assemblies for the older four-roller, grease-lubricated, type of Supporting Bearings.



Turning cast-steel tire for 10 ft. diameter rotary cement kiln in Vulcan machine shop. Much larger tires, either solid or sectional, can be cast in our steel foundry and machined on our large boring mills.

16"-face ring gears for 10 ft. diameter rotary cement kiln being cut simultaneously in Vulcan machine shop. Spur gears up to 20 ft. pitch diameter and 40"-face can be cut on this machine. Smaller gears are cut on automatic machines of a different type.



Vulcan Shell Sections can be arranged for either field welding to the old sections of the shell or, if preferred, for field riveting to present circular butt straps. Shell sections can also be furnished complete with tires and reinforcements attached to the section.

PRINT IN BINDING

For a Quick Recovery



"Quick Recovery" is the job of the Heavy Wreckers built by Ward LaFrance for the armed forces. When a tank, truck, or half-track is put out of action, these rugged trucks go out and get them. They bring 'em back through sand, muck and rocky terrain, over nearly impossible trails or, often enough, cross country.

Using this equipment, a Rigger-Wrecker graduating class at the O.R.T.C., Aberdeen Proving Ground, hung upon an unchallenged speed record by recovering an overturned five-ton truck from a deep ditch in three minutes and 28 seconds, under simulated battle conditions.

If your fleet has suffered from lost tonnage due to wartime lack of trucks, Ward LaFrance trucks are the best prescription for quick postwar recovery. Whether your needs call for dump trucks, over-the-road tractors (gasoline or Diesel), or vehicles engineered to your individual needs, Ward LaFrance offers your best profit opportunity: . . . A plan developed particularly for fleet owners makes it possible for you to take full advantage of the rugged power and dependability of Ward LaFrance trucks on a basis which will cut the cost of transportation to the bone.

WARD LA FRANCE

TRUCK DIVISION

GREAT AMERICAN INDUSTRIES, INC.

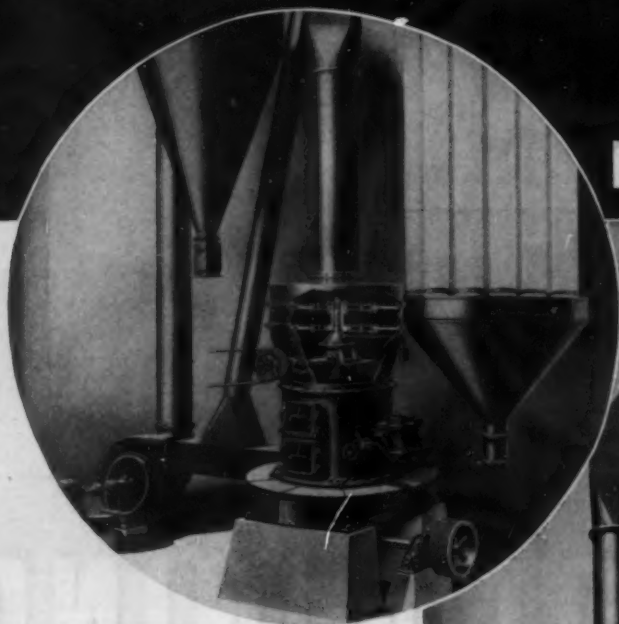
ELMIRA,



NEW YORK

PHOSPHATE ROCK GRINDING

with Raymond
ROLLER MILLS



HIGH SIDE ROLLER MILL

**For
Direct Application**

to the soil by the "Triple A" program, finely pulverized phosphate rock testing 85% to 95% through 200-mesh or better is required. This is economically produced with the whizzer-type High Side Roller Mill. Fineness control is effected by changing the speed of revolving whizzer blades, and the mill gives extra large capacities of uniform finished material. Ask for Catalog No. 51.

**For Acidulation→
where medium fineness
is required**

RAYMOND
PULVERIZER DIVISION



LOW SIDE ROLLER MILL

This is the standard mill for grinding materials to 100-mesh fineness, and it has been the stand-by of the fertilizer industry for many years. It is a low-cost producer of ground phosphate rock, agricultural limestone and similar products. Easy adjustments in separator for fineness control. Ask for Catalog No. 34.

COMBUSTION ENGINEERING COMPANY, INC.

Sales Offices in Principal Cities
Canada: Combustion Engineering Corp. Ltd., Montreal

1307 North Branch Street, CHICAGO 22, ILL.



Body with open or scoop end
(Right) Same body elevated.

X-112 BODIES

and

T-4440 HOISTS

for

OPEN PIT MINING



Body with automatic
downfold tailgate.

Fleets of Trucks, equipped with Gar Wood X-112 Bodies and T-4440 Hydraulic Hoists, are hauling the biggest loads ever moved by trucks on production schedules. Lower mining costs have been made possible by speeding up the handling of overburden, ore and coal.

SPECIFICATIONS

HOIST—Hydraulic, twin cylinder, telescopic.

PUMP—Gear type with aluminum wear-plates.

POWER-TAKEOFF—2-gear single speed.

BODY—Heavy duty with pressed-steel, box-type side braces and cross members.

BODY SHELL— $\frac{1}{4}$ " sheet steel with 2" wood filler.

WEARPLATE— $\frac{1}{4}$ " with floor angles or $\frac{1}{8}$ " without. Longitudinals 8-inch "H" beams.

CAB SHIELD— $\frac{1}{4}$ " plate.

FLOOR ANGLES—Optional.

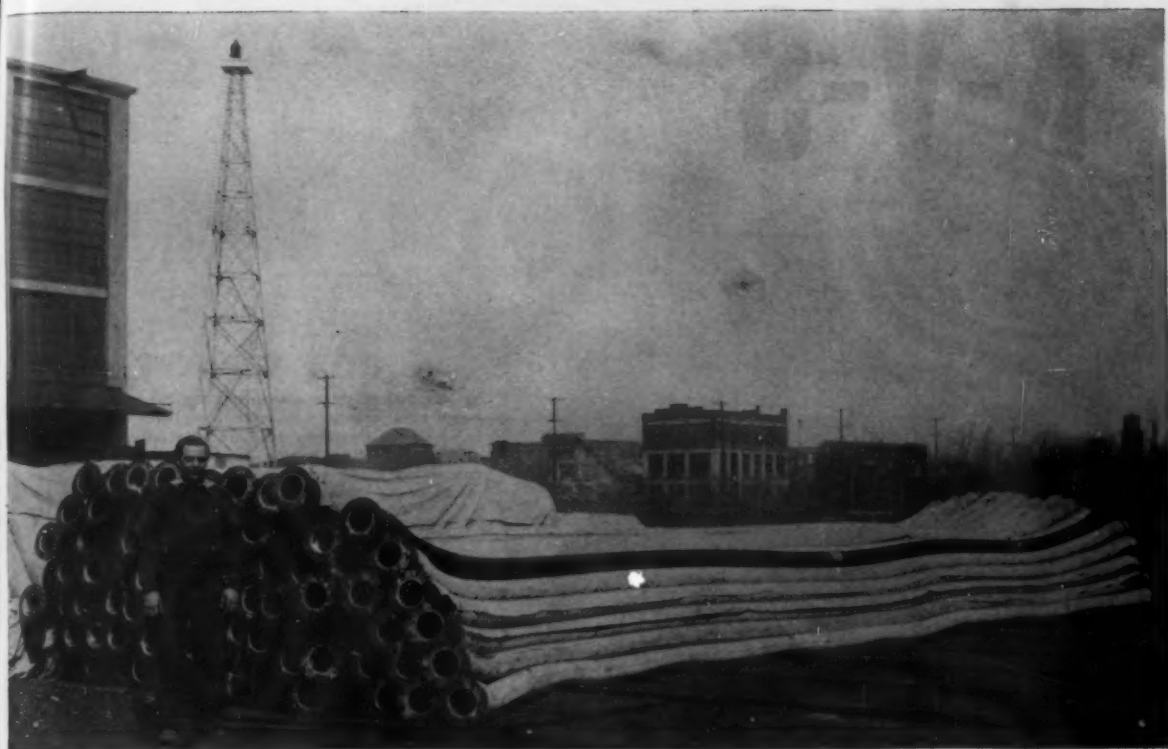
Automatic gate
opens as body
elevates.



GAR WOOD INDUSTRIES, Inc., Detroit 11, Michigan

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT



War requires a lot of HOSE

When the requirements of War needs hose, Quaker gives that order the right of way. You would not want it otherwise.

War does demand an unlimited amount of hose. Even with Quaker's large capacity to turn out thousands of feet daily, it still is not enough to supply both the War requirements and the needs of the civilian customers.

Here are the types of hose that the War must have in unlimited quantities: Fire Hose, Oil Suction and Discharge Hose, Special Oil Hose for fueling ships, Submarine Rescue Hose, Under Water Welding Hose, Special

Crash Truck Hose, Air Hose, Water Hose and Steam Hose.

The oil conveying type of Hose shown in the illustration is only one of the many kinds that is required for a successful waging of the War.

Prospects are getting brighter to that day when Quaker's production can be devoted 100% to civilian requirements.

For 60 years, Quaker has been manufacturing Quality Industrial Products . . . Belting—Hose—Packings and Moulded Parts. Regardless of what your rubber problem may be, feel free to consult with us—

"If there is a way to get it done—Quaker will do it"

QUAKER RUBBER CORPORATION

PHILADELPHIA 24, PA. • NEW YORK 7 • CLEVELAND 15 • CHICAGO 16 • HOUSTON 1

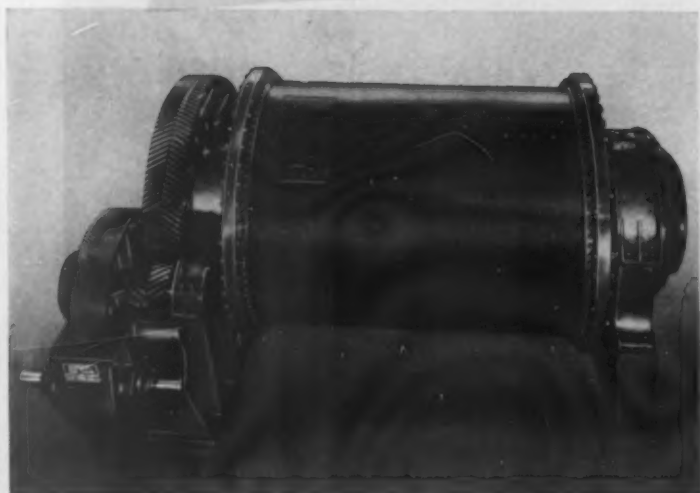
Western Territory

QUAKER PACIFIC RUBBER COMPANY • SAN FRANCISCO 5 • LOS ANGELES 21



K-V-S

Each machine designed



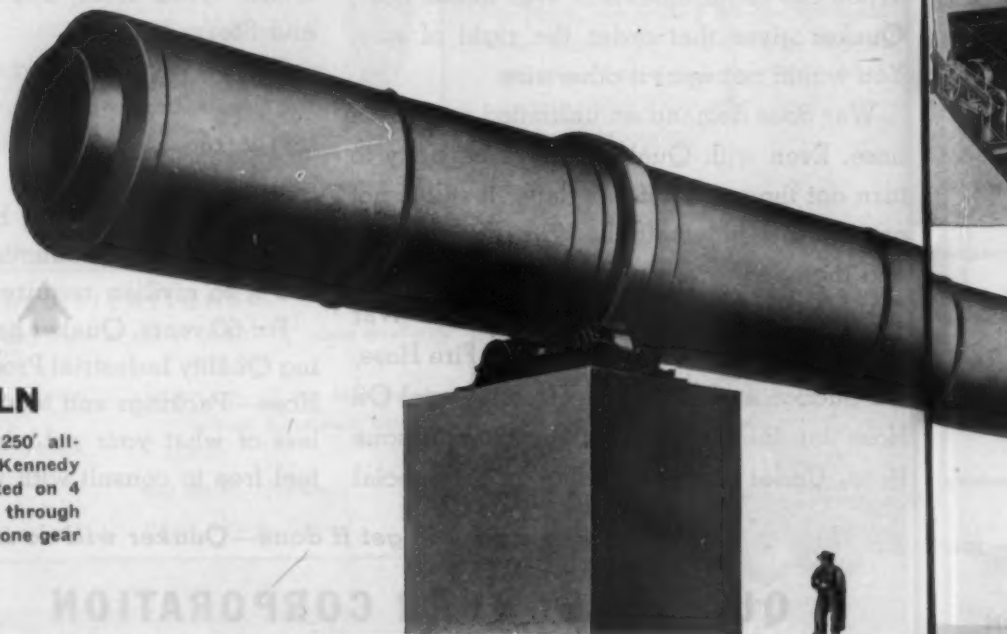
■ We manufacture machinery for the complete cement, lime, crushing or screening plant...machinery in which the materials used are especially selected to suit the work for which intended . . . machinery containing many exclusive features developed as a result of its extensive application.

KENNEDY INTEGRAL GEAR DRIVEN TUBE MILL

The new KENNEDY Integral Gear Drive for Tube Mills can be used on Combination Ball Mills, Wet Grinding Tube Mills, Dry Grinding Tube Mills and Air Swept Tube Mills. It is impossible to mis-align these gears because the gear housing supports both the discharge end of the mill and the roller bearings carrying the gears. All bearing seats are machined in a jig at the factory to a tolerance of 3/1000 of an inch.

KENNEDY ROTARY KILN

Shown here is a 10' x 9' x 250' all-welded steel construction Kennedy Rotary Kiln. It is mounted on 4 riding rings and is driven through a totally enclosed herringbone gear reducer.



KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

for BETTER PERFORMANCE

FULL POWER FOR ACTUAL CRUSHING

KENNEDY BALL BEARING GEARLESS CRUSHER

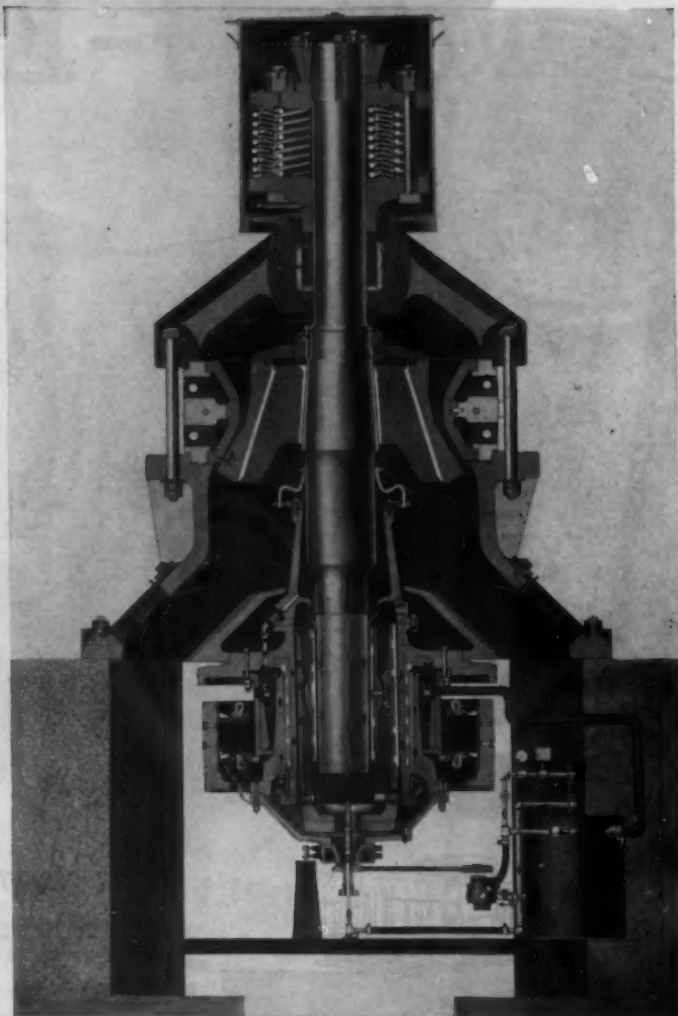
With a Synchronous Motor built in its pulley, this machine shows 80% saving in the cost of maintenance and a saving of 50% in power over geared crushers. It has produced 156 tons per hour when set to 7/16" between the head and concaves at the bottom.

The motor runs on ball bearings and is continuously lubricated by a force feed lubrication system. The motor is built specially for this crusher duty and is the finest available.



KENNEDY Vibrating Screens

... give positive action on the screen cloth without transmitting vibration to supporting members. They are made in a wide variety of sizes with single or double decks and to meet any screening requirements. They maintain the highest efficiency at all times.



Write Today —

for our catalog and description on these and other types of KENNEDY machinery.

2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

A mountainside p with G-E diesel-e



**diesel-electric
INDUSTRIAL
LOCOMOTIVES**

WHY IT PAYS TO USE DIESEL-ELECTRICS

Availability—90 per cent up! The diesel-electric carries sufficient fuel for several days' operation, runs for long intervals between overhauls, and requires only periodic inspections.

Always Ready to Go—The diesel-electric starts on the press of a button. No unproductive time is spent getting locomotive ready for work.

Fuel Costs Low—The diesel-electric's high efficiency allows it to operate on a fuel cost that is only a fraction of that of a steam locomotive. Moreover, you don't have to keep the engine running to keep up steam.

One-man Operation—The diesel-electric needs only a one-man crew, as against two usually required on a steam locomotive.

Maintenance Simplified—The diesel-electric has no boiler, firebox, nor heavy reciprocating parts, thus greatly simplifying maintenance.

A High-return Investment—Cost records show that G-E diesel-electrics often return 20 to 30 per cent annually.

25-TON 45-TON 50-TON 65-TON 80-TON



plant beats 4% grade electric!

The world's largest cement plant
— Permanente Cement Com-
pany, near San Jose, California.



The cement plant of the Permanente Cement Company, near San Jose, Calif., is backed against a mountain slope. Most of the track linking the plant to the Southern Pacific line is on a grade of $2\frac{1}{2}$ per cent, and one crucial 400-foot section has a grade of 4 per cent!

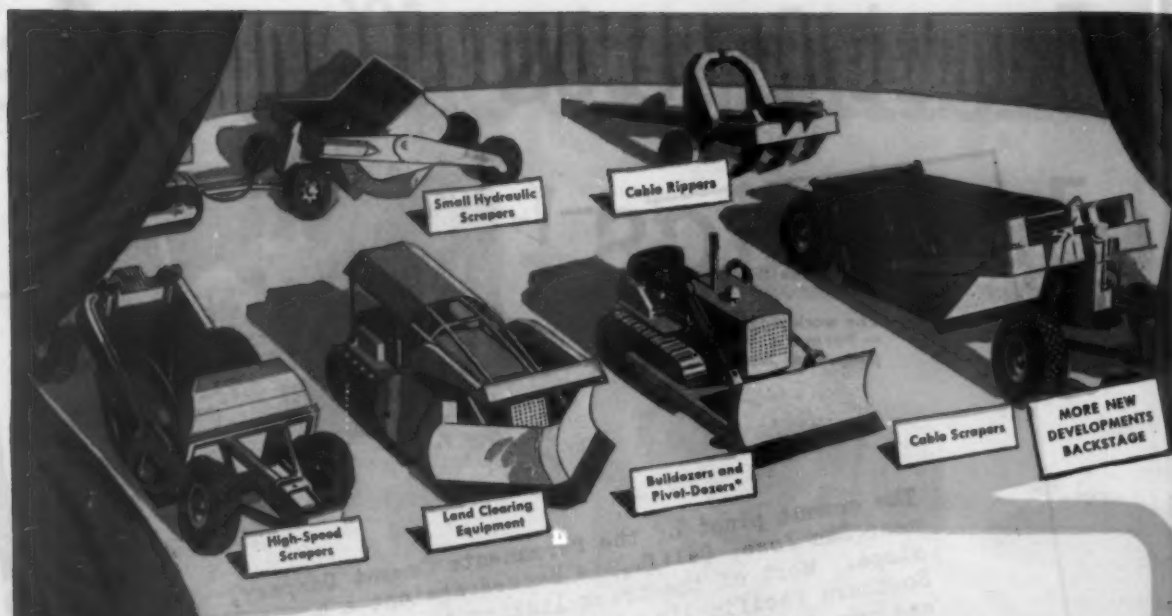
To keep loaded cars of cement, "sugar rock," and other materials moving in and out, two 65-ton G-E diesel-electric switchers are kept in service 16 hours a day. Loads of 300 tons are hauled up and over the back-breaking stretch of 4 per-cent grade with only a 100-foot start. The smooth, steady power of electric drive practically "gears" the locomotives to the track for this tough job. And these locomotives are equal to this drag at a moment's notice — they don't have to wait to "get up more steam".

Like many modern plants, Permanente Cement Company began operations here with G-E diesel-electrics. Operating costs ruled out other types of motive power, regardless of how low the first cost might have been. More than five years' experience has confirmed the wisdom of the choice.

Whether you're equipping anew or considering replacement of present equipment, G.E. can submit cost data based on applications like your own. This information will help you choose the right types and number of diesel-electrics to pay off your investment in short order. General Electric Company, Schenectady 5, N. Y.

Buy all the Bonds
you can—and keep all you buy

GENERAL  ELECTRIC



LaPLANT-CHOATE'S 1945 MODEL REVIEW

*For the Benefit of Essential Users Who Want to Know
What New Equipment Will Be Available This Year*

Despite the continued heavy military demand for LaPlant-Choate equipment, there is a possibility that increasing quantities of certain models will be available this year to civilian users with WPB approval. Therefore, in order to give you as much assistance as possible in planning your 1945 equipment needs, we are presenting a review of current LaPlant-Choate models scheduled for production early in '45.

Naturally space won't permit showing you "the complete cast" here because LaPlant-Choate is building over 30 different models of earthmoving and land clearing equipment—both cable and hydraulic operated—for use with all sizes of "Caterpillar" track-type and high-speed, rubber-tired tractors. However, your La-Plant-Choate "Caterpillar" distributor, who has been selling and servicing dependable LaPlant-Choate equipment for over 20 years, will gladly give you full information. See him today! LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

*Trade-Mark applied for

LaPLANT-CHOATE
Earthmoving and Land Clearing Equipment



Here's
limestone
Diesel D
hammer
and shov
Speaking
Diesel h
Schildbe
ever sav
when a
And, of
of power
Diesel w
erating
neered
lower g
famous
jection
amount
They re
tendant
beyond
fuel, w
no ope
hauls a
exampl
D13000
ing the
'Caterp
plant,"
them in
availab
For stil
"Caterp
supply
nation's
shorten
"Cater
the "
"Cater
CATERPI

"BEATS ANYTHING YOU EVER SAW!"

Here's E. F. Schildberg's Midwest limestone set-up. Two "Caterpillar" Diesel D13000's and four D8800's run hammermill, jaw crusher, conveyors and shovel.

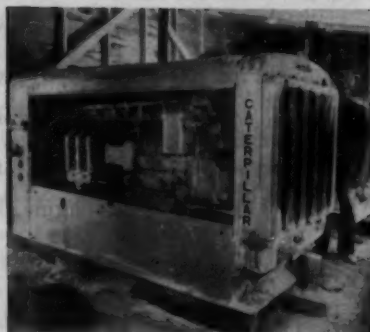
Speaking of the way a "Caterpillar" Diesel handles a heavy load, Mr. Schildberg says: "Beats anything you ever saw for pulling—it will hang on when a slug hits and lug like steam."

And, of course, there's no other type of power to compare with "Caterpillar" Diesel when it comes to all-round operating economy. These finely engineered engines burn the inexpensive lower grade fuels; and through the famous "Caterpillar"-built fuel injection system they get an amazing amount of power out of every drop. They require no specially trained attendant—and practically no attention beyond keeping them supplied with fuel, water and lubrication. There are no operating adjustments; and overhauls are few and far between. For example: one of Mr. Schildberg's D13000's went 7000 hours without having the head off. "I'd certainly buy 'Caterpillar' Diesels if starting a new plant," said he, "and would have them in everything—even in trucks if available."

"THE EARLY BIRD, ETC."

For still some time the demand for "Caterpillar" Diesels will exceed the supply available to catch up with the nation's non-war needs. Best way to shorten delivery time on your new "Caterpillar" Diesel is to be among the "early birds" in seeing your "Caterpillar" dealer.

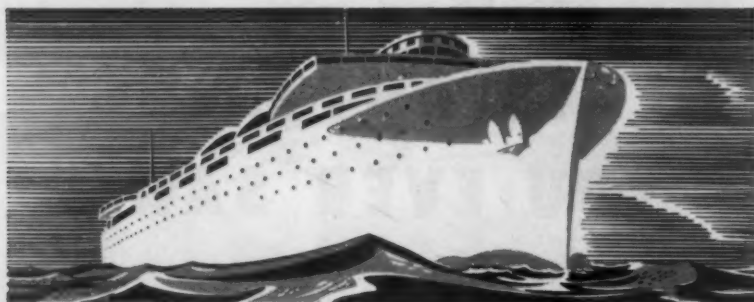
CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS



CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT



Your ship comes in

When the ship's engines have the cylinders treated with PORUS-KROME . . . *your ship comes in*. It is mighty important in marine engines to do everything possible to prevent the ship being held up for engine repairs far from home.

This is equally true when "your ship" is a bus . . . or a truck . . . or a farm tractor working the far forty. Reliability of engine performance, which assures that you will always get home, is most important.

PORUS-KROME, because of its peculiar characteristics, reduces scoring and scuffing and the risk of piston seizure to the absolute minimum. It not only adds to the reliability of the engine, but it multiplies

the life of the cylinders from four to twenty times, thus greatly reducing costs of overhauling for cylinder repairs.

PORUS-KROME, applied to cylinder bores by the Van der Horst process, is pure, hard chromium which has myriads of tiny pores and channels in its surface. These pores and channels serve as reservoirs which hold lubricating oil and feed it back to the cylinder surface as needed. Better lubrication, plus the fact that chromium is so much harder than iron or steel, reduces wear to a minimum.

Plan now to have PORUS-KROME in your gasoline and Diesel engines. Write for booklet telling more about PORUS-KROME.

PORUS - KROME



Good for the Life of your Engines


U. S. PATENTS 2,005,876 AND 2,014,004

VAN DER HORST CORPORATION OF AMERICA

AN AFFILIATE OF DRESSER INDUSTRIES

OLEAN • NEW YORK
CLEVELAND 11 • OHIO

This "HIGH PRIORITY" ORDER for OSGOODS **CAN'T WAIT!**



This Fighting Osgood 20 might have been yours! But it's needed for an important job near Aachen, Germany, making it necessary to "back-order" your new equipment for a while yet. And other Osgoods that might have been yours are needed almost everywhere you might touch a map. In fact, they're needed—and being delivered—wherever dirt must be moved to wage war . . . International News Photo

Osgood has delivered over 1000 power shovels to the Army Engineers alone since Pearl Harbor. Rugged outfits for rugged service, many of them are in crucial "headline" battle actions, where a road must be built . . . an airstrip leveled . . . a beachhead landing pier finished . . . or a street cleared . . . before the issue can be settled. Under such conditions, there can be no substitute for speedy, efficient Osgood dependability—because *these jobs can't wait*.

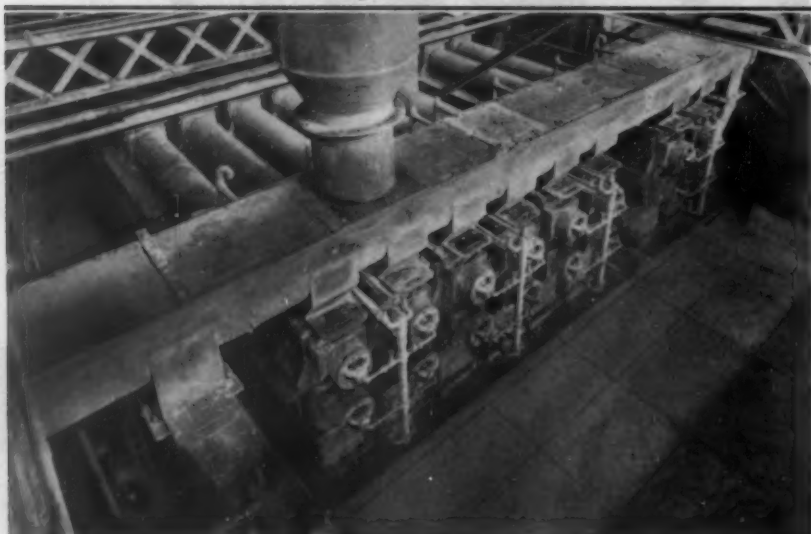
Meantime, the Osgood *you're* patiently waiting for will be a better machine for the waiting—ready to deliver profit-making performance equal to the vast peacetime tasks ahead.

BUY STILL
ANOTHER
WAR BOND!



<p>THE GENERAL EXCAVATOR COMPANY CRANES, DRAGLINES AND SHOVELS DIESEL, GAS, ELECTRIC</p>	<p>Associated with The General Excavator Company</p> <h1>OSGOOD</h1> <p>THE OSGOOD COMPANY • MARION, OHIO</p>	<p>OSGOOD SHOVELS, DRAGLINES AND CRANES CRAWLER & WHEEL MOUNTED DIESEL, OIL, GAS, ELECTRIC</p>
---	---	---

Satisfactory Performance . . . Result



4
more coolers
ordered

FULLER DRY PULVERIZED MATERIAL COOLERS



Write for Bulletin PMC-1,
illustrating and describing
the Fuller Dry Pulverized-
Material Cooler.

The eight-unit Fuller cooler installation illustrated above, for cooling finished Portland cement and put into operation a few months ago, has proved so satisfactory that this particular company has ordered four more cooler units for installation in one of their other plants.

Every installation of Fuller Coolers has proved satisfactory. Performance has been everything expected of them and temperature of material delivered to storage has been sufficiently satisfactory to meet all required specifications.

Cooling of cement is becoming constantly more important and every consideration should be given to this question by every cement-plant operator. This cooler is simple in design and construction and can be installed under most any installation conditions.

We're ready to work with you on your cooling problems . . . no obligation on your part.

FULLER COMPANY CATASAUQUA, PENNSYLVANIA

Chicago 3 • 1144 Marquette Bldg.
San Francisco 4 • 421 Chancery Bldg.
Washington 5, D. C. • 618 Colorado Bldg.



FULLER-KINYON, FULLER-FLUXO[®] AND THE AIRVEYOR CONVEYING SYSTEMS
ROTARY FEEDERS AND DISCHARGE GATES . . . ROTARY AIR COMPRESSORS
AND VACUUM PUMPS . . . AIR-QUENCHING INCLINED-GRATE COOLERS . . . DRY
PULVERIZED-MATERIAL COOLER . . . AERATION UNITS . . . MATERIAL-LEVEL
INDICATORS . . . MOTION SAFETY SWITCH . . . SLURRY VALVES . . . SAMPLERS

PMC-8

Save
Hauling
Costs

LOAD YOUR ROCK IN

TOURNATRAILERS



Big 17-yard Tournatrailer hauled rock at 14.9 m.p.h. from 100 yd. in Missouri.



Shovel loaded each Tournatrailer in 2.5 minutes, 7 swings.



Controlled rear dump unloaded rock clear of tires.



When strip overburden, this smart operator used LeTourneau Carryall scraper... then switched Tournapull prime movers to Tournatrailers and hauled out the rock.

Because of its simplicity and advanced design, the rugged, rear-dump Tournatrailer cuts your equipment investment and your operating cost.

Job-proved prime mover: The Tournatrailer is powered by the job-proved 150 h.p. Tournapull (over 2700 built and shipped), which pulls and steers with two front drive wheels.

Speeds fit quarry operation: 4 speeds forward plus reverse; top 14.9 m.p.h., ample for quarry hauling. Plenty power all through range to get into high gear quickly and climb pit grades easily.

Ample traction: Full weight of prime mover, plus 25% of trailer and its load, on driving wheels gives a firm, sure grip for quick starts and fast hauling. Big-diameter tires (21.00 x 24) on both pulling and trailing unit give large-area ground contact for flotation and easy rolling over bumps and rocks, rugged strength to stand hauling over quarry floors. No overloading of tires on uneven ground or wedged-rock damage as with dual tires.

Long wheel base: Tournatrailer has a wheel base of 18'7", which, plus big low-pressure tires, provides easy riding for both operator and machinery. Load rides between tires; no spring maintenance. Air hydraulic brakes on trailer wheels give safe control. Steering with power wheels improves maneuverability.

Save spotting and loading time: One spot takes 17-heaped yards (an approx. 20 ton gross load) away from shovel. Body has top opening of 8' x 12'8", with overall height of only 8', giving shovel operator a roomy target so he can swing and dump faster. Ample clearance, body to cab, helps fast, safe loading.

Clean, positive-control rear dump: Cable-controlled trailer body slides back, cleans load off the trailer bed, out the rear, clear of tires. By opening slowly, rock can be released a little at a time. Simple dump method eliminates expensive truck hoist machinery; reduces maintenance, keeps center of gravity always low.

Tournatrailer interchangeable with Carryall Scraper: For stripping, you can switch from trailer to a 15-yard Carryall Scraper on the same Tournapull prime mover. This Tournapull rig cuts stripping costs by self-load, self-spread, plus high-speed hauling.

It will pay you to check low-cost Tournatrailer hauling for your quarry and pit operation. For more information, see your LeTourneau distributor TODAY.

LETOURNEAU TOURNATRAILERS

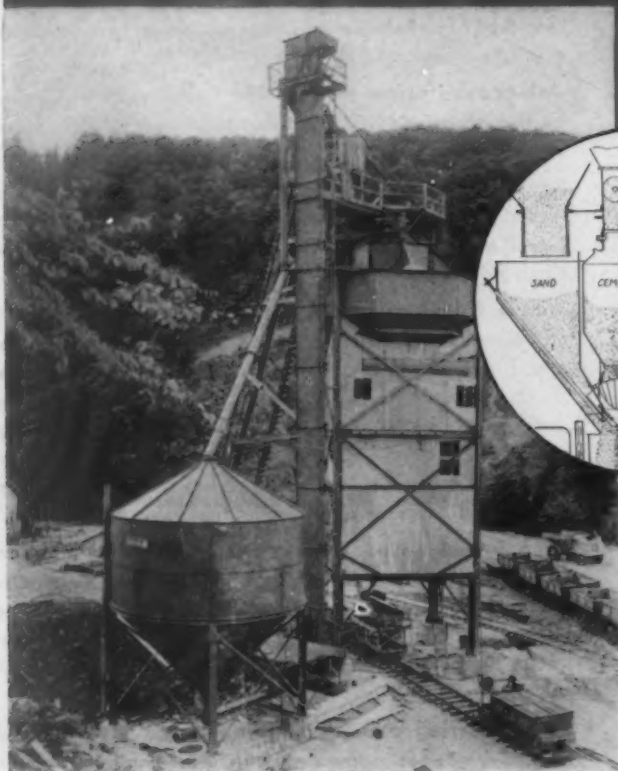
Manufacturers of Tournapulls® Angledozer® Bulldozers® Tilt-Dozers® Carryall® Scrapers® Power Control Units® Rovers® Tournatrailers® Tournacranes® Tournatrucks® Sheep's Foot Rollers® Tournaropes® Tournaweld® Tournalifts®

Trade Mark Reg. U. S. Pat. Off. M.L.E.

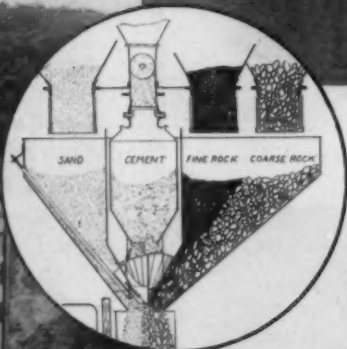
HOW DO I

Know

MY TOWN CAN SUPPORT A READY-MIX PLANT



The Johnson Portable Section Bin illustrated is designed for use on jobs where there is a large amount of concrete to be poured and the batching is relatively fast. The larger storage capacity gives greater time leeway in switching of cars and for other minor delays.



**Here's Why Johnson Engineers
Can Help You Plan Your Transit or
Ready-Mix Plant for the Bigger
Profits at Minimum Investment**

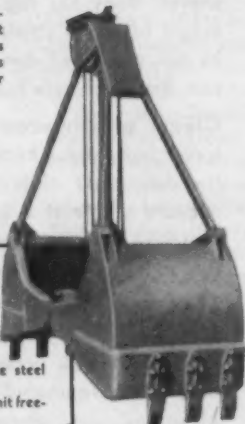
• How many people live in the area you plan to serve? What is your competition? How many yards of concrete will you sell per year? Is the plant on a railroad? How far from the aggregate supply? Will deliveries of materials be made by railroad or truck?

The answers to questions like these result in a plant layout drawn to the measure of your market, put you in business with Johnson equipment that delivers scientifically batched material as you need it... equipment that can be economically expanded as your market grows.

Remember Johnson Batchers have been specified on the largest concrete projects where equipment must deliver 24 hours a day,

WITHOUT FAIL

For experienced engineering service and proved equipment write us.



Improved JOHNSON All-Welded Buckets

All-welded construction eliminates rivets, bolts, and other impending projections, assuring best balance and better digging quality in all kinds of material.

Renewable lip edge-bar of tough manganese steel combats wear.

Needle-bearing mounted closing sheaves permit free-running cable action at all times.

General purpose type, $\frac{1}{2}$ to $1\frac{1}{2}$ yards capacity in stock for immediate delivery.

Write for Data on
Johnson's
**READY-MIX PLANTS
BULK CEMENT HANDLING
EQUIPMENT
CEMENT STORAGE BINS
CONCRETE BUCKETS
BATCHERS**

the C. S. JOHNSON COMPANY



CHAMPAIGN • ILLINOIS



Here's how you can get TOP Specification Sand

When job requirements demand a uniform and special size, grade, or type of sand . . . when sand of a special quality is essential for particular purposes . . . when only sand that meets certain exacting specifications will be acceptable . . . then you need the efficient processing equipment developed by DORR Engineers from their years of experience doing pioneer work in this and similar fields.

THE DORRCO SYSTEM is designed to meet the needs of both large and small sand and gravel beds. Equipment using the smaller DORR units may be installed for commercial sand and gravel operations of 25 tons an hour and they will process with the same high standard of performance as the larger DORR units which are used in bigger operations handling up to 3,000 tons per hour.

Plan NOW to make low grade sand and gravel beds yield top specification sands of all types and uniform sizes by using the various combinations of DORR equipment. A DORR Engineer will be glad to explain what the DORR System will do and how it will work under your own particular conditions.

Write for—"Making Prescription Sand at 50 tons an Hour"—it will be mailed promptly to you, upon request.

DORRCO

THE DORR COMPANY, ENGINEERS

NEW YORK 22, N. Y. . . 570 LEXINGTON AVE.
ATLANTA 3, GA. . . WILLIAM-OLIVER BLDG.
TORONTO 1, ONT. . . 80 RICHMOND ST. W.
CHICAGO 1, ILL. . . 221 NO. LA SALLE ST.
DENVER 2, COLO. . . COOPER BUILDING
LOS ANGELES 14, CAL. . . 911 WEST 7TH ST.

RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.

SUGAR PROCESSING

PETREE & DORR DIVISION
570 LEXINGTON AVE., NEW YORK 22

DORR

RESEARCH — ENGINEERING — EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

ROCK PRODUCTS, February, 1945

Today **GATES** Synthetic Rubber V-Belts

— are giving **BETTER SERVICE** than any V-Belts
Ever Made of **NATURAL RUBBER!**

*-and there is
a GATES V-Belt
precisely engineered
to fit any
special need*

1 Special Synthetic V-Belts



2 Static-Safety V-Belts



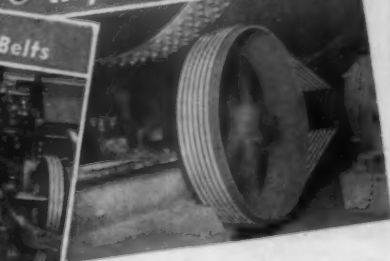
3 Cotton Cord V-Belts



4 Steel Cable V-Belts



5 Rayon Cord V-Belts



THE MARK OF
SPECIALIZED RESEARCH

No V-Belts built by anyone before the war could stand the service now daily delivered by Gates V-Belts on army tanks, tractors and self-propelled big guns. Gates has developed these greatly superior V-Belts through intensified, specialized research—and Gates is building these belts entirely of *synthetic rubber!*

The important point, for industrial V-Belt users, is this:—Every improvement developed by Gates for these Army V-Belts has also been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.

As you know, war-time improvements in many other products must be withheld from general use until after the war is won—but victory depends so directly upon production, and production so directly upon V-Belts which drive the producing machines, that Gates has been able to give you immediately, in your Standard Gates Vulco Ropes, every V-Belt improvement which Gates specialized research has developed for use in the Army's motorized equipment.

In addition, where V-Belts of special construction are required, your Gates Rubber Engineer is in position to supply a Gates V-Belt that is precisely engineered to meet your special needs.

Whatever drive problem or V-Belt problem you may have, you need only pick up your phone book and look under the heading "Gates Rubber." The Gates Rubber Engineer will bring right into your plant the full benefits of every advance in V-Belt construction and in drive operation that Gates specialized research has developed.

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO 6, ILL.
549 West Washington

NEW YORK CITY 3
215-219 Fourth Avenue

ATLANTA 2, GA.
738 C & S National Bank Building

LOS ANGELES 21, CAL.
2240 East Washington Boulevard

DENVER 17, COLO.
999 South Broadway

DETROIT 4, MICH.
8663 Grand River Avenue

PORTLAND 9, ORE.
333 N. W. 5th Avenue

DALLAS 2, TEXAS
1710 N. Market Street

SAN FRANCISCO 3, CAL.
1090 Bryant Street



But the weight is easier to handle than the cost—

It is certainly true that under some conditions Standard Thickness or still heavier pipe is absolutely required. But in far too many cases Standard Thickness pipe is chosen for *all* run of plant piping jobs simply because those in charge have gotten "used" to it.

This heavy pipe performs its service well enough. Its only fault is that it's heavier than needed for most low and moderate pressure piping—heavier than needed because light but strong Taylor Spiral Pipe can handle these every day piping requirements just as well as Standard Thickness pipe.

And the superfluous weight of Standard Thickness pipe is a costly fault. It means higher initial cost, higher installation cost, more expensive transportation and handling. As a result, changing over to Taylor Spiral Pipe has in many cases cut the cost of the erected piping

to less than half that of an equivalent installation of Standard Thickness pipe.

Made of uniformly strong skelp and reinforced from end to end by the sound spiral welded seam, Taylor Spiral is the strongest type of pipe of its weight. This high strength to weight ratio enables Taylor Spiral to handle, safely, a great many of the jobs ordinarily assigned to much heavier pipe.

Switching to Taylor Spiral for services like those listed below is made practical by the range of sizes and variety of fittings. Thicknesses range from 14 to 6 gauge; sizes from 4" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge, assuring a complete service and undivided responsibility.

TAYLOR FORGE & PIPE WORKS

General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.



CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- Sand and Gravel Lines
- Industrial Gas Lines
- Oil and Gas Gathering Lines
- Swing Pipe
- Spray Pond Piping
- Hydraulic Mining
- Dredge Lines

HOW 16,000 BELT IDLERS SHORT CUT THE HAUL TO SHASTA DAM

① FROM PIT TO DAM, over rivers, hills, railroads and valleys, 16,000 Rex Idlers rolled smoothly and efficiently—moved 12,300,000 tons of aggregate . . . moved it almost 10 miles on the longest belt conveyor in the world to complete that miracle of modern construction . . . the Shasta Dam.



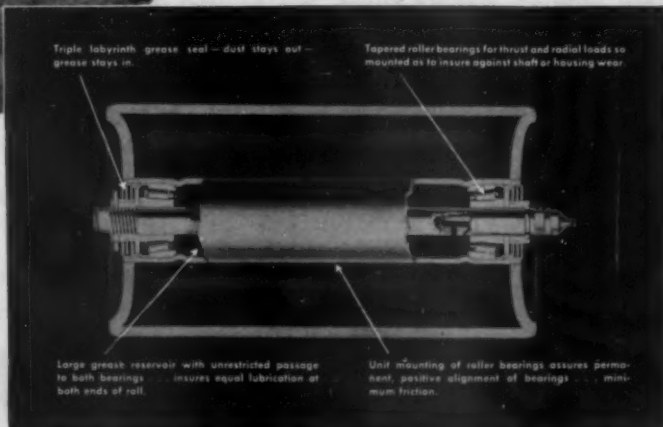
③ AND REX IDLERS KEPT IT ROLLING without stops or costly shutdowns because they are designed for hard work at low maintenance cost. Each roll is a unit in itself . . . removable and interchangeable. A special seal keeps dust out—grease in. Large reservoir with unrestricted passage to bearings insures equal lubrication at both ends of the roll. Study the diagram, then judge for yourself why Rex Idlers insure longer conveyor life and trouble-free service.

* * *

Rex maintains a staff of experienced materials handling engineers who can help you with any problem you have involving the efficient and economical moving of materials. Why not let them help you? There is no obligation. Write Chain Belt Company, 1643 West Bruce Street, Milwaukee 4, Wis.



② 20,000 MILES IN 4 YEARS—that's the remarkable record of the Shasta Belt Conveyor. Traveling at a rate of 550 feet per minute and delivering on an average of 1,100 tons per hour—this entire line was kept running by seven operators and twelve maintenance men. Remarkable? Yes, and even more so when you realize that the entire belt conveyor system could start again tomorrow on a job just as big!



BELT CONVEYORS

For Efficient Handling of Bulk Materials

CHAIN BELT COMPANY OF MILWAUKEE

Rex Chain Belt and Transmission Division, Rex Conveyor and Process Equipment Division, Milwaukee 4, Wisconsin • Baldwin-Duckworth Division, Springfield 2, Massachusetts



TAMPTITE MAKES

LOADING EASY, SIMPLE, EFFECTIVE

● The power of the dynamite is concentrated in the bore hole for maximum blasting effectiveness when you use Hercules patented Tamptite cartridges. Tamptite shells slide easily into the bore hole, and expand with slight pressure of the tamping rod to fill the hole tightly.

Tamptite cartridges conserve man-hours, eliminate completely the slitting of cartridges and loose, spilled powder around the working area. They give you better breakage, faster handling of materials, and, thus, increased output.

When ordering your favorite Hercules mining explosives, be sure to specify . . . "In Tamptite cartridges."



HERCULES

EXPLOSIVES



With Tamptite cartridges, the bore hole is loaded in the usual manner. No wasted time slitting cartridges.



The tamping rod packs the charge snugly in the hole, leaving practically no air space around the dynamite.



Continuous inserting Tamptite cartridges and compressing them until the desired loading is achieved. This compact charge means better breakage, speedier mucking, a faster mining cycle.

XR-51

HERCULES POWDER COMPANY 946 KING STREET, WILMINGTON 99, DELAWARE
INCORPORATED

ROCK PRODUCTS, February, 1945

33

Uniform **MOISTURE**

In Washed Sand for Concrete

CUTS TIME & COST

in mixing



CONTROL MOISTURE

with **AKINS** *Classifiers*

TO MAKE BETTER CONCRETE

Variation of moisture content in cement sand either causes variation in tests or adds more time for mixing. Cement contractors want neither. AKINS Classifiers are mechanically adapted to maintain moisture uniformity and are especially suited to washing sands to close separation, as in glass making . . . Unloading is unnecessary to start after shutdown,— an important advantage in

plants which do not operate 24 hours a day . . . Considering their high tonnage output, power requirements are very low.

Let us work with you in planning for post-war business. There's going to be plenty of it **SOON**.

We also manufacture:

Lowden Dryers; Skinner Multiple Hearth Roasters; Ball, Rod and Tube Mills; Smelting Equipment; Diaphragm Pumps

**COLORADO
IRON WORKS**
Company

Canadian Locomotive Co., Ltd., Kingston, Ont., Can.
Vancouver Iron Works, Ltd., Vancouver, B. C., Can.
Head, Wrightson & Co., Ltd., Stockton on Tees, England
Head, Wrightson & Co., (So. Africa) Ltd., Johannesburg
The Clyde Engineering Co., Ltd., Granville, N. S. W.

MAIN OFFICE & WORKS: DENVER 2, COLO., U. S. A.

To all business,

large

or small...

Postwar business competition is going to be tough. Whether your trucks *make or lose money* for you is going to be more important than ever before.

Today in wartime, the lack of new civilian trucks has thrown a revealing light on the performance and stamina of every make of truck in the United States. Right now is the time to dig into all the facts as they exist—to find out which trucks are standing up best under the toughest conditions trucks have ever had to face.

Now is the time to determine which trucks will do YOUR job in the BEST possible way, at the LOWEST COST during the years ahead.

The phrase "Built like a Mack truck" got into the language because of something real that is *built* into Mack trucks.

Step by step—in materials, design and workmanship—they are deliberately built to work harder—last longer—require less repair than any other truck you can buy.

This is not a "claim," but a fact! It is backed by the records of thousands of wartime Mack owners who have seen Mack's better construction pay off at a time when it was needed most.

They will tell you—in no uncertain terms—that the man who owns a Mack is lucky, and the man who plans to get one is wise.

Essential civilian users can now secure Mack trucks. Ask your nearest Mack branch or dealer for details.



Mack

TRUCKS

ONE TON TO FORTY-FIVE TONS; BUSES
FIRE APPARATUS AND MARINE ENGINES

PERFORMANCE COUNTS

Buy That Extra War Bond Today

CLEVELAND H66 SINKER

*the little fellow with
the BIG WALLOP!*



"TAILOR MADE" Cleveland Catalog

Let us send a catalog built especially around your own rock drill requirements—an extra pages to thumb through and take up valuable time. Tell us the type of rock drill or other pneumatic machines you are interested in—we'll send a catalog to supply the information you want.

LEADERS IN DRILLING EQUIPMENT

THE CLEVELAND ROCK DRILL CO.

DIVISION OF THE CLEVELAND PNEUMATIC TOOL COMPANY
CABLE ADDRESS: "ROCKDRILL" • CLEVELAND 5, OHIO

NEEED a light, easily-held, air-saving sinker for soft or medium rock? The Cleveland H66 fills the bill perfectly. Strong rotation by this 32 lb. model carries even 12-foot drills down full length in any ground. And compressors pop off more often with Cleveland H66's on the hose lines.

The H66 has drop forge construction, swivel air connections, and strong steel puller easily opened by hand. Fast, efficient automatic valve, renewable chuck bushing, and patented lock nuts to keep side rods tight are other important features. Standard chuck: $\frac{7}{8}$ " hex. x $3\frac{1}{4}$ " collared; quarter octagon also obtainable.

Bulletin 122 describes this drill in detail as well as many larger models of Cleveland Sinkers. *Ask for it!*

BRANCH OFFICES

Birmingham, Ala.	Dallas, Texas	Los Angeles, Calif.	Salt Lake City, Utah
Boston, Mass.	Denver, Colo.	Milwaukee, Wis.	San Francisco, Calif.
Buffalo, N. Y.	Detroit, Mich.	New York, N. Y.	St. Louis, Mo.
Butte, Mont.	El Paso, Texas	Philadelphia, Pa.	Wallace, Idaho
Chicago, Ill.	Ironwood, Mich.	Pittsburgh, Pa.	Washington, D. C.
Cincinnati, Ohio	Lexington, Ky.	Richmond, Va.	

CANADIAN DISTRIBUTORS

Purves E. Ritchie & Son, Ltd., 658 Hornby Street, Vancouver, B. C.

205

NEW KOEHRING CRUISER CRANE

Does short odd jobs faster. Gets there quicker — at 5.9 M.P.H. Moves loads faster because it can travel, swing, hoist, raise or lower boom...all at the same time. One-man operation, both working and traveling, cuts labor cost. Hydraulic Steering... Stable Chassis... Eight 12:00 x 20 Tires... Visibility Unlimited. Approximately 7-ton capacity.

KOEHRING COMPANY
Milwaukee 10, Wisconsin

ORDERS ACCEPTED
Now
**FOR POST-WAR
DELIVERY**



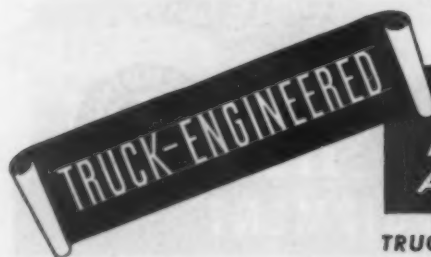
HEAVY-DUTY CONSTRUCTION EQUIPMENT



More Ford trucks on the road

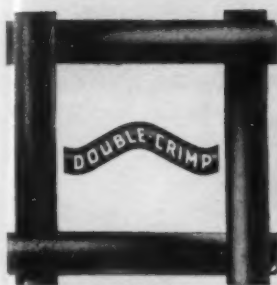
On more jobs

For more good reasons !



FORD TRUCKS
AND COMMERCIAL CARS

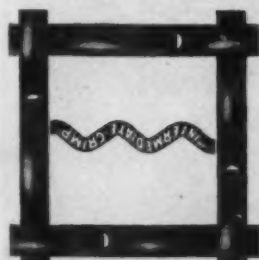
TRUCK-ENGINEERED AND TRUCK-BUILT BY TRUCK MEN



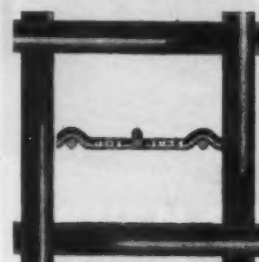
Double-Crimp



Arch-Crimp



Intermediate-Crimp



Flat-Top

"The Perfect"

Wire Cloths and Screens

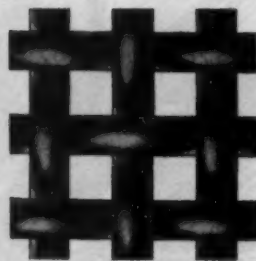
We have been specialists for many years in the making of precision wire cloths, wire screens and woven wire products.

We apply our same precision principles in fabricating wire cloths into finished industrial units, for production or processing equipments or for permanent parts of countless industrial products.

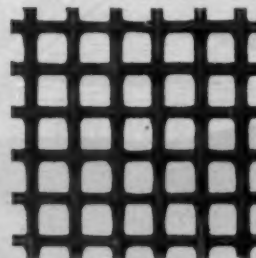
We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.

"Perfect" alloys and metals	"Perfect" Wire Cloth weaves	"Perfect" Wire Cloth processing	"Perfect" Wire Cloth products
Super-Loy	Arch-Crimp	Bending	Baskets
Steel	Coiled	Binding	Circles
Galvanized	Double-Crimp	Brazing	Cones
Tinned	Double-Fill	Calendering	Crates
Stainless Steel	Dutch	Clinching	Cylinders
Nickel-Chromium Alloys	Filter	Cutting	Discs
Aluminum	Flat-Top	Dipping	Forms
Brass	Herringbone-Twill	Dishing	Leaves
Bronze	Intermediate-Crimp	Flanging	Lengths
Commercial Phosphor	Rek-Tang	Flattening	Panel
Copper	Selvage-Edge	Forming	Pieces
Monel Metal	Straight-Warp	Framing	Racks
Nickel	Stranded	Galvanizing	Ribbons
Any special alloys available in rod or wire form	Sta-Tru	Painting	Rolls
	Triple-Warp	Shearing	Sections
	Twilled	Slitting	Segments
	Twisted-Fill	Trimming	Spacers
	Twisted-Warp	Arc-Welding	Strips
		Gas-Welding	Template shapes
		Spot-Welding	Trays

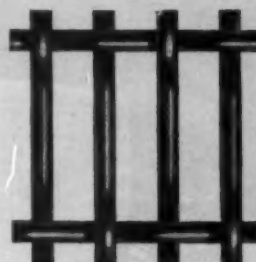
We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.



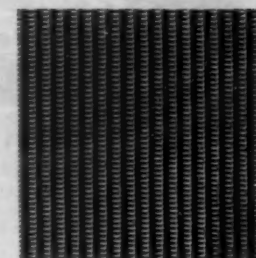
Double-Crimp



Galvanized

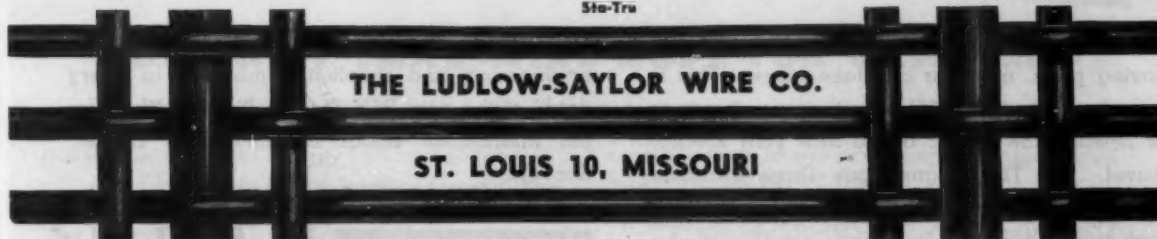


Rek-Tang



Dutch Weave

Sta-Tru

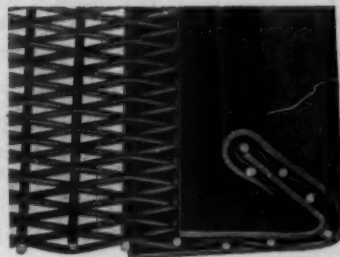
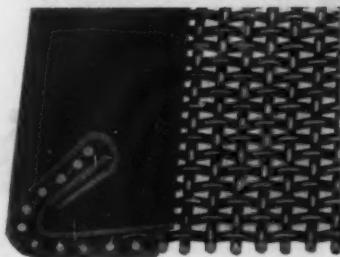


THE LUDLOW-SAYLOR WIRE CO.

ST. LOUIS 10, MISSOURI

LUDLOW SAYLOR PRECISION FABRICATING makes vibrating-screen decks and jackets that are easily handled—quickly installed—need fewer adjustments and renewals.

Illustrations suggest only a few of the many available types of wire cloth and woven wire screens, which may be custom-finished with attachments to fit your particular processing installations.





How We Harnessed a Magnet to Eliminate Wear

Where there is no mechanical contact between moving parts, no wear can take place. This is the principle which P&H uses to transmit power for hoisting the dipper of the new P&H Electric Shovel. . . . The *Magnetorque Drive* transmits torque by electro-magnetic forces rather than by mechanical contact. Designed specifically for Electric Shovel operation, it eliminates motor commutation problems, sliding gears, mechanical clutches and other complicated mechanisms. Reversing the hoist motor is no longer necessary. Hoisting is completely independent of all other operations.

The *Magnetorque Drive* is typical of the advanced engineering and simplicity embodied in every detail of the new P&H Electric Shovel. Write for full information about the new P&H Electric Shovels.

P & H

CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

ELECTRIC
SHOVELS

4465 W. National Ave.
MILWAUKEE 14, WISCONSIN

HARNISCHEFGER

HOISTS • WELDING ELECTRODES • MOTORS

THE GREATEST FORWARD STEP EVER MADE IN ELECTRIC SHOVEL DEVELOPMENT

ROEBLING



QUESTIONS AND ANSWERS

Q Why are three or more seizings recommended to hold the end of a rope when one would keep it from unraveling?

A With non-preformed rope it is almost impossible to hold the strands sufficiently tight with one seizing. If rope lay is lost or if any of the strands is allowed to shift from its balanced relation with respect to the others, improper rope life will very likely result.

Q Is it necessary to use seizings on a preformed rope?

A It is not necessary to use seizings to keep preformed rope from unlaying because all wires and strands are set to their helical forms. However, it is advisable to use seizings to prevent the strands from being forcibly unlaidd and distorted when cutting or handling the rope. Naturally, preformed rope must be seized when preparing it for socketing.



YOU CAN'T TAKE WIRE ROPE FOR GRANTED!

AND JUST TRY and find a "gentle" job in a quarry! From boom and hoist lines on power shovels to holding and closing lines on clam shells *every* job's a tough one.

The kind of jobs that call for Roebling's tough "Blue Center" Wire Rope . . . with its proven stamina to deliver long service . . . its engineering—both in our plant and on your job—that assures economical operation by reducing costly shutdowns and expensive maintenance practices.

Find out for yourself how Roebling "Blue Center" Wire Rope fights fatigue and abrasion; how its extra strength and flexibility make it tops for all quarry work—as well as *all* general heavy-duty work.

And find out, too, how Roebling engineers can help

you choose the *right* rope for *every* operation. A telephone call to our nearest branch office is the first step toward greater returns from your rope-rigged equipment. Why not make it today?

JOHN A. ROEBLING'S SONS COMPANY

TRENTON 2, NEW JERSEY

Branches and Warehouses in Principal Cities

WIRE ROPE AND STRAND • FITTINGS • SLINGS
ELECTRICAL WIRES AND CABLES • COLD ROLLED STRIP
WIRE CLOTH AND NETTING • SUSPENSION BRIDGES AND
CABLES • HIGH AND LOW CARBON ACID AND BASIC
OPEN HEARTH STEELS • ROUND AND SHAPED WIRE • AERIAL WIRE
ROPE SYSTEMS • AIRCORD, SWAGED TERMINALS AND ASSEMBLIES



PACEMAKER IN WIRE PRODUCTS

Happy Warrior



The Buckeye Clipper enjoys its war-time role of helping the Allies on all war fronts, judging by the endless gruelling jobs it does without complaint, according to eyewitness accounts. A T/4 in the Army Engineers hit the nail on the head when he called the Clipper "A Happy Warrior."

Every Clipper is equipped with Mevac Vacuum Power Control which speeds up and smooths out which crowd, hoist, swing and travel, is easier on the transmissions and engine and greatly reduces operator fatigue. Proved in war, you'll profit with Clippers in the post-war era. Send for 24-page book — "The Age of Clippers."



Quickly Convertible to Shovel, Trench Hoe, Dragline



Built by Buckeye

Buckeye Traction Ditcher Co., Findlay, Ohio



Convertible Shovels



Trenchers



Tractor Equipment



Road Wideners



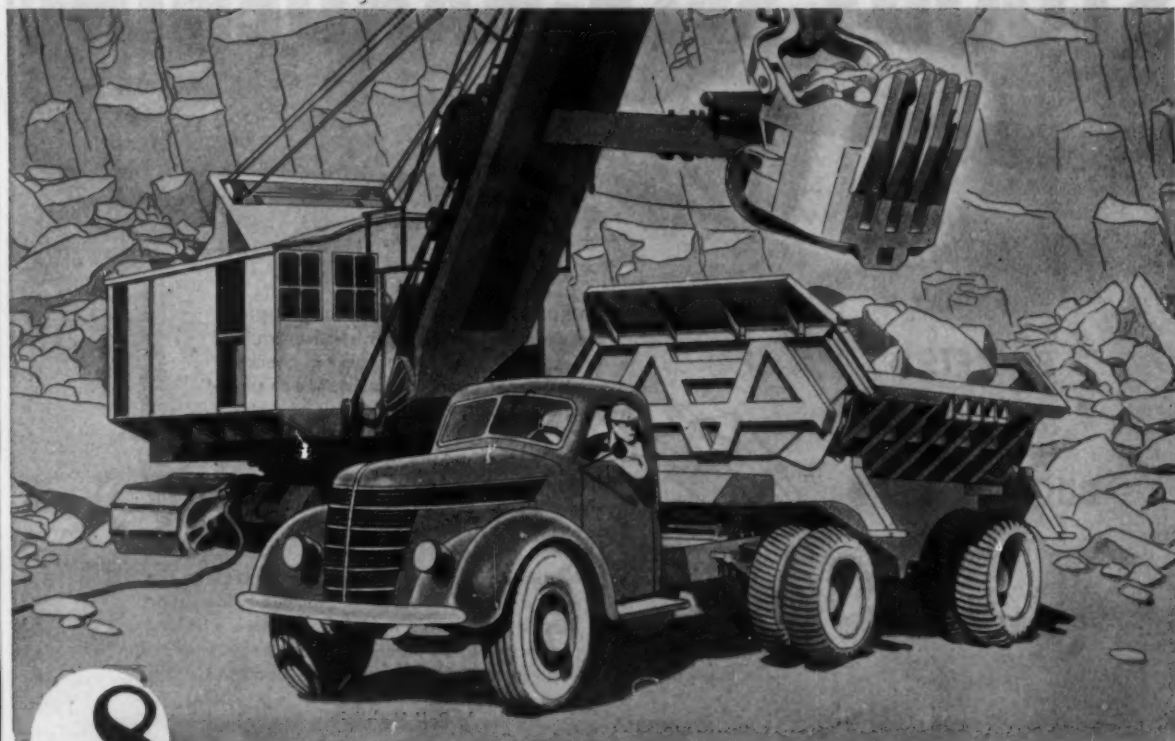
R.B. Finegraders



Spreaders

ACHIEVEMENT

—measured in millions of tons!



8 Unknown Years Ago . . . Semi-Trailer Haulage Today Moves 40 Million Tons Annually

When EASTON engineers were asked to build the first semi-trailer for quarry haulage eight years ago, the idea was new, untried, challenging. The first units were notably successful because EASTON had a background of achievement in solving quarry and mine haulage problems. And those pioneering Models RP-8 and RP-10 are today still in use and doing their part to swell to forty millions per year the tonnage of rock and ore loaded safely, hauled cheaply and discharged efficiently from side dumping EASTON Trailerized Mine Cars.

Write to: Engineering Counsel, Easton Car & Construction Co., Easton, Pa.



EASTON


INDUSTRIAL CARS
TRUCK BODIES · TRAILERS
ELECTRIC LIFT TRUCKS

B-1013

- 1 Model TR-15D—Double bodied, 15 to 20 ton capacity for use where crusher size or hopper length is limited.
- 2 Model CW—Thirty ton iron ore hauling overhead hoist side dump truck body.
- 3 Model TR-15T—Tandem "monkey" axle running gear with 80,000 pound capacity overhead hoist dump trailer.


Fight power shovel wear with STOODY SELF-HARDENING

BUCKETS ➔




- If you're handling coarse materials, apply Stody Self-Hardening in stringer beads parallel to flow of material. Deposit stringers in checker-board patterns for maximum resistance to abrasion from fine, loose earth.

BUCKET TEETH ➔



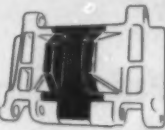
- Avoid solid deposits of Self-Hardening on bucket teeth. Stringers in various patterns give excellent protection when deposited parallel to or at slight angle to tooth travel.

TRACK ROLLERS ➔




- Maintain track roller size by protecting rim with a single coat of Stody Self-Hardening. Keeps shovel weight on rollers where it belongs, lowers wear on other track parts because of lower coefficient of friction and reduced track slapping.

TRACK PADS ➔



- Stody Self-Hardening keeps lugs out to size, retards wear on roller path, assures more accurate mesh with tumbler lugs, and reduces track-throwing due to worn track assemblies.

DRIVE TUMBLERS and IDLERS ➔



- Stody Self-Hardening maintains shape and dimensions of drive tumbler lugs, reduces abrasion and friction against track parts... lowers tendency of idlers to wear flat spots when working in fixed positions.

WHEREVER SHOVEL WEAR OCCURS, you'll get maximum protection with Stody Self-Hardening because it gives double the wear of ordinary manganese electrodes, bonds firmly with manganese steels, and resists chipping even under the terrific impact encountered on bucket parts.

Stody Self-Hardening is priced at only 50c per pound, f.o.b. Whittier or distributors' warehouse. Available through 600 U. S. distributors. Stody's Specification Sheets give detailed hard-facing information on all types of heavy, earthworking equipment. Your copy is free—write today.

STOODY COMPANY

1129 WEST SLAUSON AVE., WHITTIER, CALIFORNIA

STOODY HARD-FACING ALLOYS
Retard wear... Save Repair

BUILD BETTER Superhighways

High cost of materials no longer is a vital factor influencing the construction of the superhighways that will keep the nation's roads far ahead of traffic needs. Iowa has developed a complete line of equipment that achieves large volume production at lowest possible cost by skillfully taking advantage of all the factors influencing maximum and uniform production.

The Cedarapids Morok plant, for example, is an all-portable, super quarry crushing plant that handles material in a continuous flow from quarried rock to delivery trucks

in one operation. The big primary will take any rock that will pass through the bottom of a 1 1/4-yard shovel. Production averages 150 to 200 tons of crushed rock per hour. The plant can be easily moved to and from quarry locations as jobs change. Your only competition will be another Morok owner.

If your aggregate producing or asphalt mixing equipment is not ready for coming postwar construction jobs, now is the time for you to improve your bidding position for production and profits. We invite you to investigate Cedarapids equipment.

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA



Cedarapids
Built by IOWA

THE IOWA LINE of Material Handling Equipment Includes

PORTABLE POWER CONVEYORS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX)

PORTABLE STONE PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
VIBRATOR AND REVOLVING

BUCKET ELEVATORS
STRAIGHT LINE ROCK AND
GRAVEL PLANTS

You can order Materials Handling Machinery *NOW!*

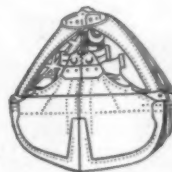
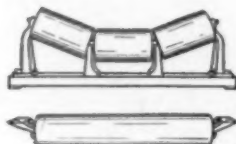
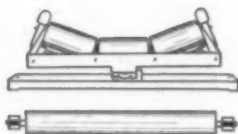
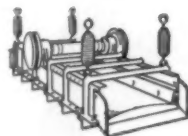
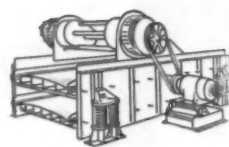
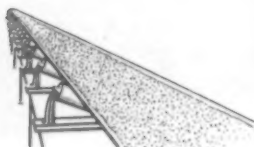
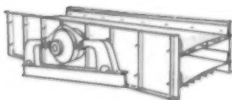
There's no doubt about it—the aggregates industries have "taken it on the chin." You have been producing in quantity to meet the pressure of wartime demands with your equipment operating overtime, thus hastening its obsolescence. Yet you have rarely been able to obtain priorities for new or replacement machinery.

Tomorrow you may be faced with another and equally difficult problem. For when priorities are finally lifted, every user of heavy-duty machinery will pour in a flood of orders that will inevitably create a new output jam.

Fortunately you can eliminate much of these future delays—through the Robins Prior Preference Protection Plan. Under this 3-P plan you may now order Conveyors, Screens, Idlers, Pulleys, Belts, Screen Cloth—in fact any materials handling machinery that Robins makes.

Your order will immediately be given a 3-P number and assigned a top position on Robins post-war manufacturing schedule. Robins will follow this schedule impartially, filling each order in turn the moment conditions permit.

So check your equipment today. Consider carefully its wear, the parts needed for replacement, the units that must be added to enable you to meet post-war competition. Then rush your order to Robins, to assure a low number under the 3-P plan. And remember—the faster you act, the better your position on the delivery list. When writing, please address Dept. RP-2.



ENGINEERS, MANUFACTURERS AND ERECTORS OF MATERIALS HANDLING MACHINERY

ROBINS makes: BELT CONVEYORS • COAL AND ORE BRIDGES • BUCKET ELEVATORS • CAR AND BARGE HAULS • CAR DUMPERS • CAR RETARDERS • CASTINGS • CHUTES • CONVEYOR IDLERS AND PULLEYS • CRUSHERS • FEEDERS • FOUNDRY SHAKEOUTS • GATES • GEARS • GRAB BUCKETS • PIVOTED BUCKET CONVEYORS • VIBRATING SCREENS • SCREEN CLOTH • SELF-UNLOADING BOAT MECHANISMS • SKIP HOISTS • STORAGE AND RECLAIMING MACHINES AND SYSTEMS • TAKEUPS • LOADING AND UNLOADING TOWERS • TRIPPERS • WEIGH LARRIES • WINCHES • WINDLASSES

ROBINS
CONVEYORS
INCORPORATED
Founded in 1896 as Robins Conveying Belt Co.
PASSAIC • NEW JERSEY

FOR MATERIAL AID IN MATERIALS HANDLING It's ROBINS

Editor • BROR NORDBERG

Editorial Consultant • NATHAN C. ROCKWOOD

Managing Editor • RALPH E. TONGERSON

Associate Editor • HERBERT E. SWANSON

Assistant Editor • M. K. SMITH

Contributing Editors • VICTOR J. AZBE • DR. F. O. ANDEREGG • M. W. LOVING

TRADEPRESS PUBLISHING CORPORATION • 309 W. JACKSON BLVD., CHICAGO, 6

ROCK PRODUCTS

A CHALLENGE TO INDUSTRY

SINCE the German counter-offensive, post-war planning by industry appears to have been relegated to the background. Friends tell us that the very words "post-war" are mentioned in whispers in the nation's capital.

Our first goal must be the winning of the war, but industry also still has a patriotic obligation to prepare itself for reconversion to civilian goods manufacture and production to the limit of its resources without sacrifice to the war effort.

When federal government spending will have to be cut to possibly 25 percent of its current rate, the shock that must be cushioned will be tremendous. Furthermore, a much more abrupt entrance into the reconversion period will follow because the enemy's proven ability to continue the war will necessitate intensified war production to the end.

Nonetheless, private industry has a tremendous challenge to face. In order for it to survive and grow, after the shooting is finished, industry must be prepared to demonstrate that it is qualified to furnish economic security.

Labor will insist that gains in its behalf be preserved. A high standard of living with "guaranteed employment" and jobs for 60 million workers are objectives being proffered for post-war prosperity. Real planning, by industry, is the only means to ascertain the practicability and feasibility of any of these plans.

Government controls will not be moderated abruptly after the war, and they shouldn't be, so there will continue a period of belt-hitching during reconversion. Then will follow a period of fulfilling long accumulated demands for civilian needs. It is almost certain that excess profits taxes will be eliminated in the all-out drive to satisfy the backlog for civilian goods, and with it will come the incentive to reduce plant operating costs.

High wage levels are economically desirable, provided high productivity follows. Labor rates increased approximately 59 percent during the 1939-1944 period to figures that likely will remain as high, or even may spiral upward, when the post-war boom is in swing.

Industry, including producers of all types of rock products, must analyze its market opportunities—each operation in its own locality—and correlate production with potential demand. Each plant must be made ready to service projects that will be built. Then, it follows that any establishment must engineer its operations for profitable production.

An appraisal of markets should not be based upon past performance alone. Stoppage of war construction projects has served to emphasize the fallacy of serving one or two customers to the exclusion of others,

and the very same abrupt disappearance of markets has brought to light resourcefulness in developing new outlets or new products for new uses. Rock products and concrete products suddenly were found, or made, adaptable to new applications.

An accurate appraisal of tonnage or volume to be produced should, unless conditions absolutely prohibit, encompass new potential markets and new products as well as new uses for existing ones. In the concrete masonry industry, for example, the potentials for precast concrete floors might well be given serious thought. They may even equal the volume of concrete merchandised as building block.

Sizes and capacities of operations—if geared to serving all really potential markets and providing for additional volume of sales to accrue as a result of intensified promotion effort in the development of these new markets—will hedge against the inroads of new enterprises which might not legitimately "belong" in a given locality.

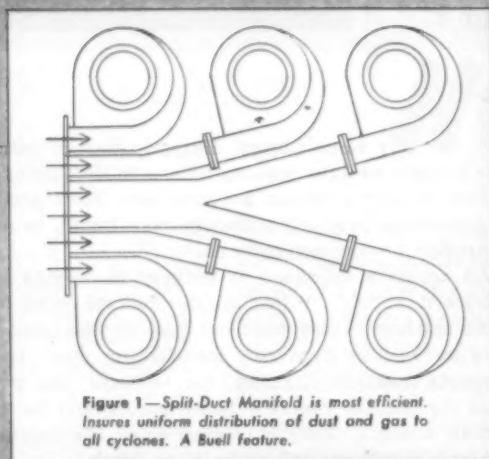
The National Gypsum Co. has publicly announced the scope of its program for post-war expansion, wages and opportunities for jobs, after a carefully-appraised survey of the prospective market. This concern has a nine million dollar modernization and new construction program ready now for the release of machinery and manpower. Labor has been informed that 25 to 30 percent more men will be employed than in 1939 and at high wage levels.

The new construction contemplates betterment of pre-war products, entirely new manufactured items and the adaptation of war-developed products to civilian use.

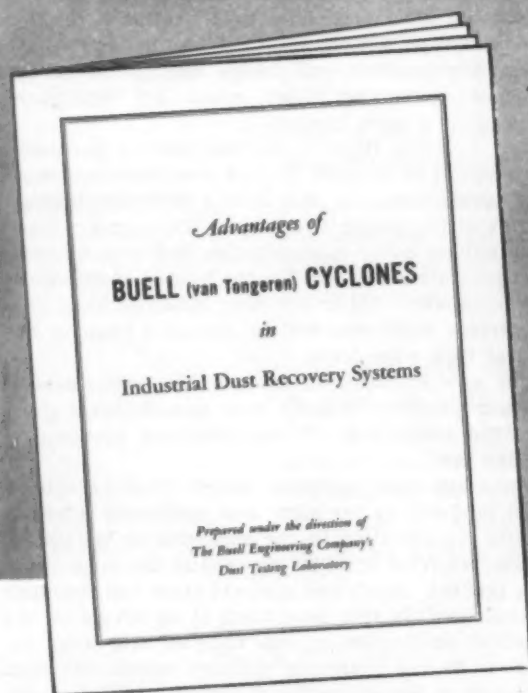
Plans also must comprise specific plant operations. High productivity for labor and machinery warrants careful consideration in the enlarging or building of plants. Wasteful practices do exist in the majority of rock products plants and many of them can definitely be evaluated. In this issue there is an article on the practical application of job analyses and wage incentives to the quarrying industry, which has been published to emphasize the extent to which wasteful practices, often elementary in nature, cut into profits. Labor and cost saving equipment as such are desirable but, to be totally effective, related phases of operation in new or enlarged operations must be coordinated. Then an industry could get around to determining what annual wages may be anticipated—even though seasonality may prohibit regularity of employment.

Bror Nordberg

A PICTOGRAPH of efficient dust distribution



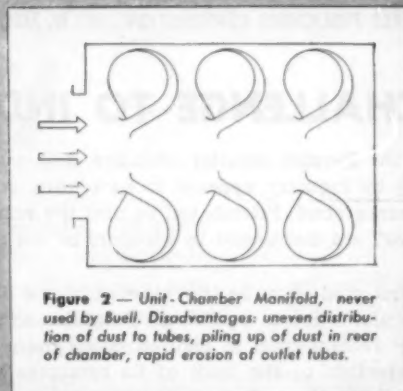
THE MOST EFFICIENT METHOD (Buell's)



Every engineer and operating executive should have a copy of the bulletin shown above as his guide in the selection of the right dust collection equipment.



BUELL ENGINEERING COMPANY, INC.
Suite 5000, 2 Cedar St., New York 5, N. Y.
Sales Representatives in Principal Cities



THE LEAST EFFICIENT METHOD (Never used by Buell)



BOTTOM VIEW OF MANIFOLD ASSEMBLY

Buell Design ELIMINATES CLOGGING MINIMIZES EROSION

The scientific development of inlet manifolding for multiple unit cyclone dust collectors has played an all important part in the uniform distribution of both gas and dust in cyclone collectors. (How proper manifolding is achieved in Buell Dust Recovery Systems is shown in the pictograph on this page. What happens when the dust load is not uniformly distributed, and how serious these disadvantages may be, is best described in the bulletin shown on this page, from which these two manifold sketches were taken.

DESIGNED TO DO A JOB, NOT JUST TO MEET A "SPEC"

To back up the statement on manpower ceilings issued at the White House by Director of War Mobilization and Reconversion James Byrnes, the following priorities regulation has been issued by the War Production Board:

Compliance with WMC Regulations

(a) *Priorities and allocations may be withdrawn or modified if WMC regulations are not complied with:* Any priorities or allocations granted by or under the authority of the WPB may be withdrawn or modified at any time when the WPB makes a finding that materials or facilities are not being used most effectively for the prosecution of the war as a result of a failure to comply with an employment ceiling or hiring regulation of the War Manpower Commission.

(b) *Procedure:* Priorities or allocations will be withdrawn or modified under this regulation only after the WMC has certified to the WPB that an employer has refused to comply with an employment ceiling or hiring regulation within a reasonable time after he has been notified of his failure to do so. If, in the opinion of the WPB, there is reason to believe that materials or facilities are not being used most effectively for the prosecution of the war as a result of the failure to comply, it will institute proceedings before one of its Compliance Commissioners to determine whether there is proof of this, and will give the employer appropriate notice and opportunity for a hearing.

(c) *What priorities and allocations are covered by this regulation:* This regulation applies to all kinds of priorities and allocations which are granted either before or after this regulation is issued, including preference ratings, allotment numbers or symbols, and directions, authorizations, or grants of appeals to deliver or receive material or to manufacture products or to use facilities.

Conventions Banned After February 1

Strict controls have been set up covering the holding of trade, professional, and industry conventions after February 1, 1945. Col. J. Monroe Johnson, Chairman of the War Committee on Conventions, Office of Defense Transportation, has issued regulations governing conventions, representing groups of 50 or more

people. These regulations provide that application forms must be filled out and then passed upon as to whether the meeting would tend to support the war effort. It is expected that very few meetings will be approved and many applications are now being turned down. The test is, "how will the winning of the two wars we are now fighting be impeded if the meeting in question were held to an attendance of 50 or canceled outright."

Cement Increase in Northwest

Manufacturers of cement in the states of Wisconsin, Illinois, Indiana, western Kentucky, North and South Dakota, Minnesota, Iowa and eastern Missouri, have been granted an increase not to exceed 20c per bbl. in their present maximum prices, effective January 8. The increase applies to all types of portland cement, except white cement, and includes masonry cement and other special types. This increase is granted as an amendment to No. 9, MPR No. 224. Executive Secretary V. P. Ahearn, in a letter to members of the National Ready Mixed Concrete Association, advises that O.P.A. is giving consideration to issuance of an order permitting ready mixed concrete companies to pass along the cement price increase in the Northwestern area.

Release Some Construction Equipment

War Production Board announced January 18 that 25 items of construction equipment which formerly could be sold to purchasers other than war agencies only upon specific authorization may now be sold with this restriction. Order L-192, as amended, transfers the 25 items of equipment from Schedule A to Schedule B. Schedule B items formerly could be sold only on purchase orders rated AA-5 or better. This rating requirement has been removed from the amended order. Certification and other restrictions on the sale of repair parts have been removed, since repair parts are now in relatively good supply, with the exception of engine parts. Some of the items of equipment listed among the 25

changed to Schedule B of interest to the rock products industry are as follows: Batching, construction material; batching plants, construction type; bins, construction material, portable and stationary type; bulk cement handling plants; draglines (slack line); hoists, contractors and material handling exceeding 6000 lb. line pull at 250 r.p.m. line speed or exceeding 1,300,000 ft. lbs. effort based on second wrap of cable; mixers, concrete truck or agitator type (with or without elevating towers); pumps, concrete; pumps, portable engine or electric-motor driven units mounted on skids, self-priming centrifugal pumps; washing and screening plants, portable type.

Silica Refractory Brick Increase

An increase of three percent in present ceiling prices of fire clay and silica refractory brick produced in the area east of the Mississippi River, and in the State of Missouri, was announced recently by O.P.A., effective January 8, 1945. The increase applies not only to fire clay and silica refractory brick, but also to ladle brick, sleeves and nozzles, runner brick, hot tops, super clay and high alumina brick, ground fireclay, silica cement and other low temperature mortars.

Lime Gets Class 1 Rating

As a result of a conference by an Interagency Committee on Tire Rationing and Classification, composed of representatives of O.P.A., W.F.A., O.D.T., W.P.B., and others, the National Lime Association has announced that the lime industry has been classified under Industrial Chemicals and has been granted a Class 1 rating to receive heavy duty truck tires. It had formerly been placed under Quarry Products in the Extractive Industry Group and had been given a Class 3 rating.

Boost California Block Prices

An order has been issued by O.P.A. under MPR 188, increasing the prices of concrete masonry block in the counties of Los Angeles, Riverside, San Bernardino, and Orange, California. The following maximum prices have been authorized:

Dimensions	F.o.b. Plant (Maximum Price Per 1000 Blocks)			Addition for Delivery (Miles from Producer's Plant)		
	Hollow	Cap	Solid	Under 12	12 to 20	Over 20
2" x 4" x 8"	.....	.....	\$ 16.00	\$2.00	\$ 4.00	\$ 6.00
2" x 4" x 8"	.....	.....	17.00	2.50	5.00	7.00
2" x 4" x 12"	.....	.....	28.00	3.50	6.50	9.00
4" x 4" x 12"	\$37.00	\$42.00	47.00	4.50	8.00	11.50
4" x 6" x 12"	48.00	53.00	70.00	5.50	10.00	14.50
4" x 8" x 12"	59.00	64.00	95.00	6.50	12.00	17.00
4" x 12" x 12"	84.00	90.00	110.00	9.00	17.00	23.00

PROVED ON OVER 400 UNITS

The ball-bearing principle of grinding on B&W Direct Firing Pulverizers

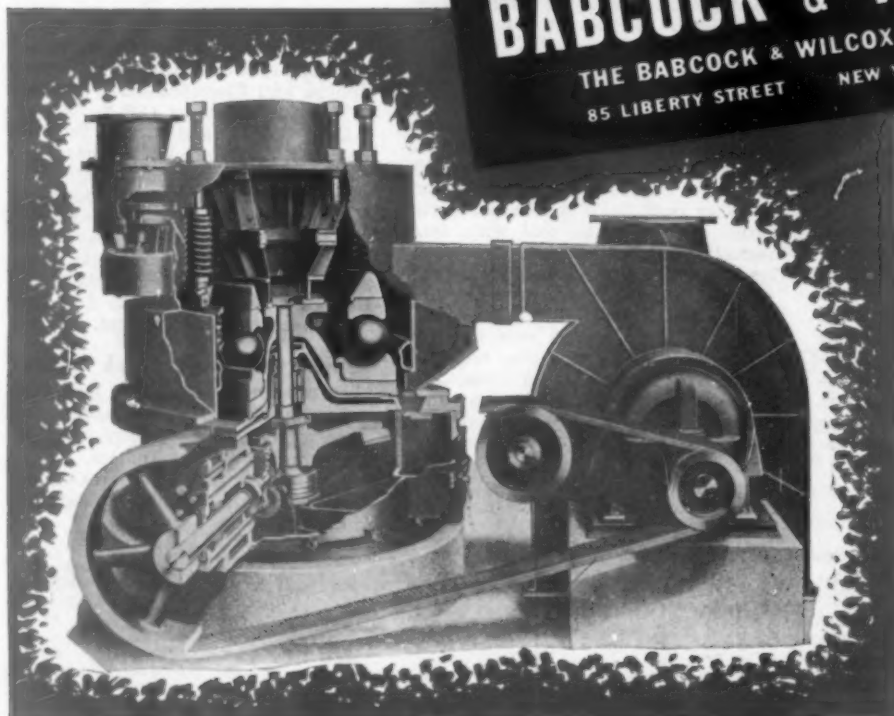
The ball-bearing principle of grinding combines crushing and attrition under controlled pressure. It produces the fineness of fuel necessary for efficient combustion at all rates of operation. This principle of grinding permits a wide range in size of pulverization and conditions of operation. The pulverizer is moderate in space requirement per unit of capacity.

B&W Type E Pulverizers are

known for their:

- Consistently high fineness.
- Ability to handle high-moisture coals.
- Reliable operation and low maintenance.
- Uniform delivery of coal.

B&W's well-rounded experience in design, manufacture and installation of direct-firing pulverizers is at the service of cement plant owners and operators.



BABCOCK & WILCOX

THE BABCOCK & WILCOX COMPANY
85 LIBERTY STREET NEW YORK 6, N. Y.

Cut-away view of the B&W Type E Pulverizer

C-39

7011

Rocky's NOTES

Delayed Action—On Opportunities

RECENTLY a story in the *Wall Street Journal* (New York City) said that the U. S. Patent Office was being deluged with requests for copies of old and largely forgotten patent specifications. It seems manufacturers and processors are conducting an intensive search for ways to use their facilities (and operators their faculties!) in new lines of post-war activities. Someone must have discovered there are possibilities in the ideas of inventors of bygone years—because, in the course of human events, such ideas are premature.

Every editor of mature years who has followed closely (and often led) the developments in one or more industries is well aware of the time lag of ten to twenty or more years between the publication of a sound idea or suggestion and its acceptance or application in an industry. If he is of a philosophic turn of mind he is apt to come to the conclusion that if even half the good ideas he plants in his publication bear fruit and are made use of, he has accomplished his mission. So, it is suggested that manufacturers and processors looking for things to make or ways to improve, also search through the files of good technical and industrial periodicals of the last 20 or 25 years.

Some 30-odd years ago I worked for a publisher (John A. Hill, president of the Hill Publishing Co., publisher of *Engineering News* and other industrial journals) who liked to say to the editors: "When an article has been published, forget it, go out after something new." He objected to using good office space for storage of bound volumes of the periodical. I believe his objection really was that the editors often took this point of view: "Why, we published that 10 or 20 years ago"—and so, why do it again? Mr. Hill also used to say over and over again that a periodical could well afford to publish practically the same stuff every 20 years, because it would be new to a new generation, and the older generation would have forgotten it. Of course, that was an intended exaggeration, but there is much truth in it.

A few friends have suggested that this page could be made of interest (at least to them) if I would go back to the early days of these rock product industries and contrast the way things were done then with the way

they are done today. However, to one who follows developments in an industry step by step through the years, the contrasts do not stand out. It is a matter of evolution, and evolution is usually slowly progressive with few startling contrasts. It seems to the writer that it would be more interesting from time to time to call attention to overlooked opportunities of bygone years.

Some 26 Years Ago

So turning back to 1919 for inspiration, the thing that impresses us most is the neglected opportunity of the lime industry, because in the lapse of the last quarter century, while the lime industry has made many sporadic attempts to progress, it has on the whole, not made headway comparable to its contemporary rock product industries. It was in 1918, during the first World War, that the production and use of lime for chemical and industrial purposes first exceeded that for construction.

Using our present hindsight for foresight, it seems obvious that the lime industry should have been able to see that this would be a permanent shift. After the closing of strictly war-production plants, the demand for industrial lime fell off somewhat, and lime manufacturers bent most of their efforts to attempting recovery of construction markets. The subsequent permanent pick up in demand for chemical and industrial lime came slowly but surely, and the lime industry as a whole was not so well prepared as it should have been. The industry apparently should at that time have known more about the chemical and industrial uses of lime than any of its customers. It should have known how to manufacture cheaper and better lime than its customers could—and saved customers!

Slurry Filters

Another example of the slowness with which an idea takes hold is in the adoption of mechanical filters for dewatering cement slurries. It was in April, 1919, that Rock Prod-

ucts published the first description of a filter installation in our industries. This was at the plant of the American Limestone Co., Knoxville, Tenn. The American Limestone Co. is a subsidiary of the American Zinc Co. and the limestone that it processes comes from the tailings of the zinc recovery plant. The problem was to dewater, dry and market as agricultural limestone, tailings, 80 percent through 200-mesh, which were delivered to the limestone plant by sluicing with 80 percent of water.

Because the American Zinc Co. had mining and ore-dressing engineers in its employ, naturally they turned to well-known ore-dressing practice and installed a Dorr thickener to concentrate the limestone and then pumped the settled product from the bottom of the thickener, containing about 40 percent water, to mechanical drum filters which reduced the water to about 20 percent. The limestone dust in the form of "slurry cake" was then dried in direct-fired, rotary dryers for the agricultural limestone market.

Obviously, this is almost an exact parallel of the processing subsequently adopted in the wet process of portland cement manufacture, and in that article we pointed out this possibility to the cement industry, but it was about ten years or more before it was generally accepted by that industry. We might point out here a possibility of reducing the cost of drying silica by the same process.

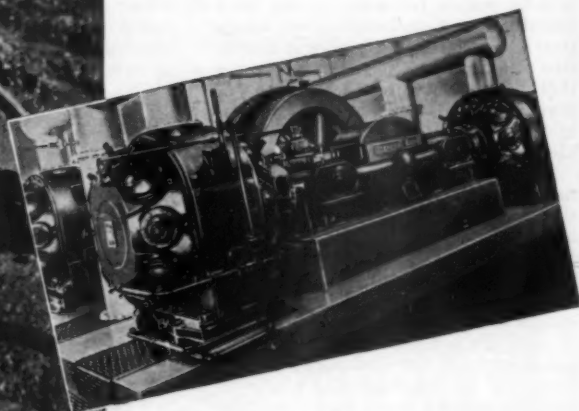
It is true that the first installation of a Dorr thickener and filters in the cement industry took place about the same time, at the Newago Portland Cement Co. plant in Michigan, but it was part of the processing for recovery of potash from the flue dust and not for slurry dewatering (see *Rock Products*, June 7, 1919, p. 29). Which reminds us that a fairly recent slurry filter installation in the cement industry was found to be removing the "alkalies in solution with the water sucked out. How about recovering the alkalies thus as a by-product?

An example of delayed action on a business opportunity we find in the same June 7, 1919, issue of *Rock Products*. A company in Bloomington, Ind., was proposing to add to its line of products a dry pre-mix of cement and aggregates packed in barrels for small household concrete jobs. Apparently, it didn't click, but some 20-odd years later our friend Arthur C. Avril, of Cincinnati, Ohio, after much experimenting in properly drying and proportioning his aggregates and cement, and packing the mix in sacks, made it click, and opened up a new line of business.

Nathan C. Rockwood



SCRUB TEAM



THE USES of compressed air in war and peace are virtually unlimited. Mining and construction are everywhere speeded by air-powered drills, grinders, riveting hammers, chippers, hoists and other tools. In the picture, taken during the building of Grand Coulee Dam, you see still another use . . . compressed air teamed up with water to scrub a concrete surface.

Successful use of compressed air in industry depends on smooth functioning of both air compressors and tools . . . immeasurably aided by effective lubrication . . . Texaco.

Texaco Alcaid, Algol or Ursa Oils in air compressors, for instance, assure wide-

opening, tight-closing valves, free piston rings, open ports, clear lines, continuous air supply. They also assure maximum service life between overhauls, fewer repairs and replacements. Their use in air compressors is world-wide.

Texaco lubricants have proved so effective in service they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States.

★ ★ ★

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.



TEXACO Lubricants

FOR ALL AIR COMPRESSORS AND TOOLS

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON SUNDAY NIGHTS ★ METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS

Wolverine Sales Manager

RICHARD C. STENGER, assistant sales manager of the Wolverine Portland Cement Co., Kalamazoo, Mich., has been appointed sales manager



Richard C. Stenger

of the company. Prior to coming with Wolverine Mr. Stenger had been connected with the Wallfill Company, a Johns-Manville distributor in the Chicago area. The present officers of the Wolverine Cement Co. are: Colby Stilson, chairman of the board; Roger C. Gleason, president; J. L. Nelson, vice-president; J. Schaffner, treasurer and comptroller, and Thomas M. Green, secretary.

52 Years of Continuous Service

HENRY F. LAMB, general mill foreman of the Trinity Portland Cement Co., Dallas, Texas, since 1919, has worked in the cement industry for 52 years and in all that time has not lost a day. Mr. Lamb is now 72 years old. In 1892 he was hired by a cement plant in Glens Falls, N. Y., to run a jaw crusher and since then has been employed in cement plants at Portland Point, N. Y.; Bay City, Mich.; Wellston, Ohio; Hudson, N. Y.; Allison, N. Y.; Concrete, Wash.; Bellingham, Wash.; Altoona, Kan.; Cement City, Mich.; Hartshorne, Okla.; Cowell, Calif.; Sigfried, Penn.; Elizabeth, Penn.; Trident, Mont., and Gilmore City, Iowa.

Slag Co. Changes

J. WALLACE JOHNSTON, special advisor and consultant to American cement manufacturers, Washington, D. C., has been elected a member of the board of directors of the Birmingham Slag Co., Birmingham, Ala. He also was elected to fill the position of vice-president and gen-

eral manager, left vacant by the resignation of George C. McCullough. Mr. Johnston formerly was vice-president and manager of the Lone Star Cement Corp. CHARLES W. IRELAND, in addition to his duties as director of personnel, has been appointed a member of the board and assistant general manager. Other company officers are C. Eugene Ireland, president and chairman of the board; C. A. Barinowski, vice-president in charge of sales and subsidiary companies; N. L. Smith, treasurer, and H. H. Himrod, secretary.

Somewhere in India

PFC. JOSEPH P. BELICK, operator and manager of a block plant in Northampton, Penn., and Coplay, Penn., before he was called to the armed forces in March of 1943, is now stationed with a B-29 superfortress bomber outfit somewhere in India. The plant at Northampton, Penn., is being remodeled and operation of the completely modernized plant will be started upon cessation of hostilities and the return of Mr. Belick from the armed forces. This plant was formerly owned and operated by the Northampton Building Block Co. and in 1939 was purchased by Mr. Belick, who plans, upon his return from war, to open several branch plants.

Ideal Change

CHARLES BOETTCHER, president and general manager of the Ideal Cement Co., Denver, Colo., has relinquished his duties as general manager but continues as president of the company. CHRIS DOBBINS, assistant to the president and assistant general manager, has been promoted to the position of general manager.

Prisoner of War

MAJOR ROBERT E. DAVIES, formerly weighmaster of the Consolidated Rock Products Co., Los Angeles, Calif., is a German prisoner of war. Major Davies is a pilot in the Army Air Force and his plane was shot down while on a mission over Yugoslavia.

English Visitor

G. ELAND STEWART, agent and manager, Billingham mine, Imperial Chemical Industries, Ltd., County Durham, England, was a recent visitor in Chicago. Mr. Stewart is a mining engineer in charge of limestone and (gypsum) anhydrite mines about 800 ft. below the surface on one of the plant sites of the company. He has a number of special problems to solve, especially as concerns drilling, loading and trans-

portation underground, and is visiting American operations for ideas and suggestions. While the rooms in his mines are high enough, they are not wide enough for use of power shovels, so that the type of loading equipment he may install is that more commonly used for coal mining in this country. In view of the proposed national service law in the United States, Mr. Stewart's comment that drafted labor for mine operation in England was not at all satisfactory is of particular interest. The laborers sent him are not experienced in mining, have no interest in the work and look upon the job as a mere war stop gap. This introduces new problems and speeds the desire for more mechanical equipment.

New Chairman Safety Committee

JOHN J. PORTER, president of the North American Cement Corp., New York, N. Y., and chairman of the Committee on Accident Prevention and Insurance of the Portland Cement Association since 1937, has relinquished his duties as chairman of the Committee. Mr. Porter was recently elected chairman of the board of directors of the North American Cement Corp. and has been succeeded as president of the company by Thomas J. Harte.

VINCENT J. HANLEY, secretary and treasurer of Marquette Cement Mfg. Co., Chicago, Ill., succeeds Mr. Porter as chairman of the Association's Accident Prevention Committee. Mr. Hanley has selected the following group of members from the committee to appraise P.C.A. safety activities and to recommend a victory pro-



Vincent J. Hanley

gram: F. C. Maus, personnel director, Alpha Portland Cement Co.; Johan Norvig, general superintendent, Penn-Dixie Cement Corp.; W. M. Powell, safety director, Medusa Cement Co.; John W. Mather, industrial relations manager, Lone Star Cement Corp. (sub-committee chairman); A. J. R. Curtis, Portland Cement Association; and J. S. Cole, Consolidated Cement Corp.

Mr. Hanley is the sixth cement company executive to head the Accident Prevention Committee in its 32 years' existence and has been an active member of the Committee for 10 years.

Gypsum Head Retires

H. B. BROCKENBROUGH, superintendent of the National City, Mich., plant of the National Gypsum Co., Buffalo, N. Y., since its construction in 1927, has retired from active service. Mr. Brockenbrough has been connected with the gypsum industry for 27 years. C. E. ANDERSON, for the past eight months assistant superintendent at the plant, will succeed Mr. Brockenbrough as superintendent. Mr. Anderson is former superintendent of the Bluebonnet ordinance plant, built and operated for the government at McGregor, Texas.

Kelley Island Promotions

A. B. MACK, vice-president of the Kelley Island Lime & Transport Co., Cleveland, Ohio, has been elected executive vice-president, and H. M. BEATTY, assistant to the president on operations, has been made president in charge of operations. Mr. Mack has been with the company for 32 years and has served in many capacities. Mr. Beatty, prior to his promotion, held the positions of industrial sales manager and general sales manager.

Universal Atlas Appointments

D. I. ELDER, research chemist and research manager, Universal Atlas Cement Co., Buffington, Ind., has been appointed research consultant, and Dr. W. C. HANSEN has been named manager of the research laboratories at Buffington. Mr. Elder started with the company as a chemist in 1925 at the Buffington plant. Dr. Hansen previous to joining the company served the Portland Cement Association in Chicago in a research capacity. He is the author of a number of publications on the constitution of cement and the durability of concrete.

Heads C.P. Division

E. F. BESPALOW, chief engineer of the Choctaw Culvert & Machinery Co., Memphis, Tenn., which has been divided into three operating divisions,

is now vice-president in charge of the concrete products division. J. M. WOOD is vice-president in charge of the sheet metal division, and JAMES L. NELLIS, general manager of the machinery department, has been promoted to vice-president in charge of the machinery division, and is the executive head of that department.

N.M.W.A. President

EDWARD I. WILLIAMS, president of the Riverton Lime and Stone Co., Riverton, Va., has been elected president of the National Mineral Wool Association. He succeeds T. C. CARTER of Cincinnati, Ohio. Mr. Williams, a mining engineer who was graduated from Columbia University in 1914, has long been identified with the mineral wool industry. He also serves as chairman of the Mineral Wool Industry War Council and industry consultant to the War Production Board. Previously he was



Edward I. Williams

president of the Industrial Mineral Wool Institute. Besides being a large producer of mineral wool, Mr. Williams' company is an important factor in the lime industry. In that connection, he is presently serving on the lime advisory committees of the W.P.B., the War Food Administration and the Office of Price Administration.

Other officers and directors of the National Mineral Wool Association for 1945 are: M. G. JENSEN, vice-president, Owens-Corning Fiberglass Corp.; W. H. HILL, treasurer, Baldwin-Hill Co.; T. C. CARTER, director, Eagle-Picher Sales Co.; L. M. CASSIDY, director, Johns-Manville Sales Corp.

Pioneer Vice-President

CLAUDE GOLDING, who has been with the Pioneer Sand and Gravel Co., Seattle, Wash., for many years and is widely known in the con-

struction field of the Pacific Northwest, has been elected vice-president of the company. This announcement was made by president Gordon Scott.

Chemist in Nevada

H. R. BRANDENBURG, formerly chief chemist of the Henry Cowell Lime & Cement Co., San Francisco, Calif., has established headquarters in Reno, Nevada, as a chemist and metallurgist. Recently Mr. Brandenburg was in charge of magnesium operations for the Idaho-Maryland mines at Grass Valley, Calif. He retains his post as technical director of the Western Mining Council.

W.P.B. Director

JOHN L. HAYNES has been made director of the Construction Bureau of the War Production Board, to succeed Arthur J. McComb, who has been named deputy vice-chairman for operations. Mr. Haynes addressed conventions of the National Sand and Gravel Association, National Ready Mixed Concrete Association, National Concrete Masonry Association and National Crushed Stone Association.

Director Talc Co.

WILLIAM R. REILLY, general superintendent of mines and mills for the Eastern Magnesite Talc Co., Burlington, Vt., has been elected a director of the company, succeeding the late John S. Patrick, former president of the company. Since 1926, Mr. Reilly has been in charge of quarrying operations for the Rock of Ages Corp., Graniteville, Vt. He was formerly identified with the Vermont Talc Company, Waterbury and Johnson, Vt.

Resigns

RAY A. YOUNG, sales manager and assistant to the president of the Northwestern Portland Cement Co., Seattle, Wash., has resigned from the company and is now on a business trip through the Middle West and East. Mr. Young became associated with the cement company when it was being organized in 1927.

Trinity Representative

J. HOWARD SLOAN, formerly with the Schumacher Wall Board Corp., South Gate, Calif., has joined the Trinity Portland Cement Co., Dallas, Texas, as West Coast representative. Mr. Sloan's previous associations were with Graham Brothers, Inc., and the California Stucco Co. of Los Angeles.

Named Superintendent

W. FRANK ALFORD, assistant superintendent of the Consolidated Quarries Corp., Decatur, Ga., has been appointed superintendent of all plant operations, reporting to Nelson Severynhouse, general manager.

Fight FTC Cement Order

UNITED STATES CIRCUIT COURT OF APPEALS recently took under advisement, following oral arguments, a motion by the Marquette Cement Manufacturing Co., to set aside a Federal Trade Commission order restraining the company and 74 other defendants from continuing to use the delivered price formula. The company charged the commission with pre-judgment of the issues, bias and prejudice against the industry in formulating the order. Edward A. Zimmerman, attorney for the cement company, told the court, it is reported, that if public business is conducted by a fast growing group of bureaucrats, it is just as well that a body as the Federal Trade Commission should be paralyzed. The Federal Trade Commission had contended that if its order against the company were set aside the authority of all government agencies would be imperiled and rendered useless.

Ready Mix for Rayon

REED & ABEE, INC., Asheville, N. C., has been busy furnishing ready mixed concrete for the expansion of rayon yarn manufacturing facilities for the American Enka Corporation at Enka, N. C. This well-known contracting firm and producer of ready mixed concrete and dry-batched aggregates had the contract for all of the ready mixed concrete, all of foundation outside of the piles, and the building of sewer, water line and filter plant extensions. Eleven mixer trucks, Rex pumps, and batching facilities were used on this job.

Colorado Silica Project

SILICA PRODUCTION Co., Chicago, Ill., is planning to develop a 40-acre deposit of good quality silica sand 14 miles southeast of Grover, Colo. Offices will be established in Greeley, Colo., and plans have been made to spend \$75,000 for machinery. Arthur S. Anderson of Chicago is president of the company, and Harold Hulse and George Michael, both of Chicago, are the owners and promoters of the mine.

Coplay Wins Army-Navy E

COPLAY CEMENT MANUFACTURING Co., Allentown, Penn., has received the Army-Navy E for the company's machine shop division which has been making war equipment. The announcement was made by D. J. Uhle, vice-president of the company, who stated that the award would be made with appropriate ceremonies on January 30.

Sell Quarry

A. M. LANPHERE has sold his quarry and lime plant located northwest of Rapid City, to Pete Lien of the same

city. The lime plant property adjoins the State cement plant on the north, and the quarry, which was formerly known as the Black Hills Marble Quarries, is north of the lime plant property. Mr. Lien operates a construction contracting business in the city.

Mica Investigation

Six mica companies won the first round of a legal battle in which the government has sought an investigation of the mica industry in western North Carolina when Judge E. Yates Webb quashed subpoenas issued some time ago requiring the companies to produce their records and papers for the past 16 years for inspection by the court. However, Judge Webb said he would allow the new subpoenas to be issued covering records of the past four years, and in which practically all the materials wanted is cited. Companies represented were: Asheville Mica Co., Asheville; Richmond Mica Corporation, Richmond, Va.; English Mica Co., Spruce Pine; Eugene Munsell Co., New York City; A. O. Schoonmaker Insulation Co., New York City; and the Mica Insulation Co. of New York City.

During the hearing the petitioners contended that it was physically impossible to comply with the terms of the subpoenas. The Government indicated that it wanted records in connection with a grand jury investigation in connection with suspected violations of the Sherman anti-trust laws.

Idaho Pipe Plant

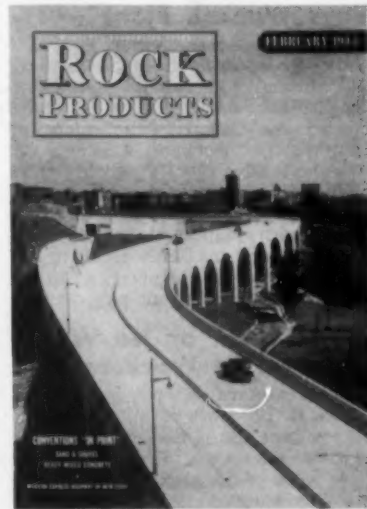
IDAHO CONCRETE PIPE Co., Nampa, Idaho, recently organized, will begin operation as soon as an 80-x 80-ft. structure on Coldwell boulevard is completed. Manager Jason Smith has announced that equipment will cost about \$30,000. The building will be constructed with concrete block walls and a concrete roof.

Vault Concern Builds

AMERICAN VAULT Co., and the Norwalk Burial Vault Corporation is constructing an \$80,000 plant in Port Chester, N. Y. The building will be 97 ft. x 200 ft. and will be constructed of concrete block and brick. It is expected that the concrete burial vault company will open its new plant in April.

Lime Plant Expansion

WASHINGTON BRICK AND LIME Co., Spokane, Wash., is planning to expand its facilities at the two plants in Spokane, and at its Oregon plant, according to a recent address by Howard Mansur, production manager, before the Chamber of Commerce.



Express highway in the New York City area

February Cover

SIGNING of the federal post-war highway construction bill by President Roosevelt which will set in motion a joint federal and state program of expenditures of over three billion dollars in a three-year period, has served to focus attention on some of the more recently completed highway construction projects which will be typical of the work to be done in areas surrounding large cities. The February front cover of Rock Products shows a fine example of superhighway construction in the New York City area. The need for such construction projects near cities as a means of relieving traffic congestion is urgent. It is believed that aggregates plants adjacent to all our cities will be particularly busy during the post-war area, supplying material for such projects.

To Use Gypsum Walls for Shipyard Buildings

HENRY J. KAISER has announced that the administration building of his Oregon Shipbuilding Corporation plant at Portland, Ore., recently destroyed by fire with a loss of \$600,000, will be rebuilt with gypsum materials. As recently announced in Rock Products, the Henry J. Kaiser interests have entered the gypsum field by taking over the management of the Standard Gypsum Co.

Pavement Yardage

AWARDS of concrete pavement for December, 1944, have been announced by the Portland Cement Association as follows:

	SQUARE YARDS AWARDED	
	During Dec., 1944	For the Year 1944
Roads	1,091,906	8,436,209
Streets and alleys ..	410,841	5,827,461
Airports	838,764	18,207,743
Total	2,341,511	32,471,413

Buys Wabash Plant

UNIVERSAL ATLAS CEMENT CO., New York, N. Y., announced on January 31 through President Blaine S. Smith that the company has purchased the Osborn, Ohio, plant of the Wabash Portland Cement Co. After extensive repairs and improvements, the plant will again be placed in operation, and will be known as the Osborn plant of the Universal Atlas Cement Co. This recently acquired plant has a capacity of about 2,000,000 bbl. of cement per year.

"War Work or No Work" for Cement Workers

A FORERUNNER of what may be expected if the "work or fight" bill now before Congress is passed is revealed in the Allentown, Penn., plan of "war work or no work" originated by the War Manpower Commission. Cement companies in this area have had their "employe ceiling" arbitrarily cut and some of the workers released have been offered work in war plants which are short over a thousand men in this area.

Cancel Concrete Institute Meeting in February

AMERICAN CONCRETE INSTITUTE will not hold the annual meeting scheduled in New York City for February, but will hold a luncheon and business session for the observance of "legal formalities." The annual meeting was cancelled in conformity with the request of the Office of Defense Transportation.

Construct Phosphate Furnace

TENNESSEE VALLEY AUTHORITY, Knoxville, Tenn., is constructing a 13,000 kw. electric phosphate smelting furnace and accessories at Wilson Dam, Ala. This furnace will be an addition to the Authority's existing phosphorus and phosphate plant at Wilson Dam.

To Expand

TRI-CITIES READY-MIX CONCRETE AND ASPHALT CO., Florence, Ala., has announced plans for expansion as soon as "conditions permit." N. S. Hatcher, engineer of the company, said that a main office will be erected on South Court street. The storage building now being built will be converted for use by a marine supply company. The plant will be enlarged and made more efficient.

Cancel Mining Meeting

AMERICAN INSTITUTE of Mining and Metallurgical Engineers has announced the cancellation of the annual meeting scheduled for February 19 to 22 at the Hotel Pennsylvania in New York City. In place of this annual meeting, the annual busi-

ness meeting will be held on Tuesday, February 20, followed by a Directors' Dinner at which Harvey S. Mudd, the new president, will be inducted.

Cement Production

BUREAU OF MINES reports that production of finished portland cement during October, 1944, totaled 9,194,000 bbl. or 18 percent below production in October, 1943, which was greater than in any other preceding month of the year. Mill shipments of 10,263,000 bbl. during October, 1944, were only 9 percent below the movement from mills in the same month of 1943; the lowest monthly rate of decline since February, 1943. As in each month since March, 1944, shipments during October substantially exceeded production. Consequently, stocks of finished cement declined slightly more than a million barrels from September 30 to an October 31 total of 16,075,000 bbl. The end-of-October stocks were lower than at any other time since the latter part of 1942.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of October, 1944, and of October, 1943:

	RATIO (PERCENT) OF PRODUCTION TO CAPACITY					
	Oct. 1943	Oct. 1944	Sept. 1944	Aug. 1944	July 1944	June 1944
The month..	53.0	45.0	44.0	44.0	41.0	41.0
12 months..	59.0	38.0	39.0	40.0	41.0	41.0

Sand-Lime Brick Production and Shipments

FOUR active sand-lime block and brick plants reported for December and four for November, statistics for which were published in January, 1945.

AVERAGE PRICE FOR DECEMBER

	Plant Price	Delivered Price
Detroit, Mich. ....	.....	\$17.00
Saginaw, Mich.	\$15.00	.....
Grand Rapids, Mich. ....	.....	16.20
Seattle, Wash.	19.50	21.50

STATISTICS FOR NOVEMBER AND DECEMBER

	*Nov.	**Dec.
Production	1,238,445	969,031
Shipments (rail)	418,000	173,000
Shipments (truck)	815,445	752,031
Stocks on hand	61,000	143,000
Unfilled orders	400,000	220,000
*Four plants reporting: incomplete, one not reporting stocks on hand and two not reporting unfilled orders.		
**Four plants reporting: incomplete, two not reporting stocks on hand and two not reporting unfilled orders.		

Gravel Contract

GIFFORD-HILL & Co., Inc., Dallas, Texas has been awarded a \$30,000 contract to supply gravel to Caddo parish, Louisiana for improvement of the roads.

Pay Increases

THE WAR LABOR BOARD has approved proposals for a 5c an hour wage increase for 248 laborers employed in southern Illinois quarries. Wage increases were approved for members of the International Hod Carriers, Building and Common Laborers' Union, AFL, at the Columbia Quarry Co., East St. Louis Stone Co., Casper Stolle Quarry and Contracting Co., and the Prairie du Rocher Quarry Co.

An additional two to seven cents an hour have been approved by WLB for about 150 employees of the Warner Company's De Vault, Penn., plant, producing crushed stone and lime products. This is also an AFL union.

Ruling Closes Mica Mines

REPORTS from North Carolina indicate that 95 per cent of the mica mines in the state have been closed as a result of the new buying policy of the Colonial Mica Corporation which went into effect January 1, according to J. V. Bowers, Newland, N. C., secretary of the recently organized Southern Mica Mine Operators. Mr. Bowers has pointed out that practically all of the mica produced in this state is classified as green or white, and that under the new Colonial buying policy only Muscovite ruby mica is being purchased by the government agency.

Convention Date Correction

IN THE NEWS item appearing on page 68 of the January issue, under the heading "Postpone Masonry Convention," there is a typographical error on the last line with reference to a proposal to hold the meetings either in May or June. The line reads, "meeting for May or June 11," but the numeral eleven should have been a quote mark as no day of the month was mentioned.

Cement Advertising

To make the public "cement conscious," the Bemis Bro. Bag Co., St. Louis, Mo., has run advertisements in *Time Magazine* and *Business Week* to show what an important part cement plays in the every-day lives of everyone in the country. The advertisement points out that four bags of cement are produced annually for every man, woman and child.

Mica Prices

CEILING PRICES ON MICA have been amended to conform with a revision of the WPB which removes several grades of mica from strategic classification. Non-strategic grades are now exempt from price control. If this should bring on inflationary prices, the OPA will be prepared to terminate the exemption.

Sand Recovery

That Connecticut Specification Again!

THE PROBLEM of processing a bank sand to meet the Connecticut state highway specifications, discussed in the December issue, p. 55, is not so easily disposed of as would appear from that discussion. Since then we have had quite an extensive correspondence which brings out some points that must be considered.

First is the inadequacy of the test-sieve size analysis. This was given by the producer as:

Passing $\frac{3}{8}$ -in.	100 percent
Passing No. 4.	98.5 percent
Passing No. 16.	83.0 percent
Passing No. 50.	12.0 percent
Passing No. 100.	1.0 percent

That analysis has two important omissions—the No. 8 and the No. 30 sieves. The No. 30 sieve is the most important of all in making a size analysis of sand because it is between the No. 16 and the No. 50 that ordinarily there is an excess or belly. Hence, it is usually in the No. 30 size range that the sand most needs correction.

Not having the missing fractions, we will have to assume that the complete sieve analysis, like similar sands, was about as follows:

By **NATHAN C. ROCKWOOD**

Passing $\frac{3}{8}$ -in.	100 percent
Passing No. 4.	98.5 percent
Passing No. 8.	93.0 percent
Passing No. 16.	83.0 percent
Passing No. 30.	40.0 percent
Passing No. 50.	12.0 percent
Passing No. 100.	1.0 percent

In that case this bank sand would have a fineness modulus of 2.73, which is a little on the fine side.

Stated another way the size analysis would be as follows:

Plus 4-mesh.	1.5 parts
4- to 8-mesh.	5.5 parts
8- to 16-mesh.	10.0 parts
16- to 30-mesh.	43.0 parts
30- to 50-mesh.	28.0 parts
50- to 100-mesh.	11.0 parts
Under 100-mesh.	1.0 part

100.0 parts

The producer proposed to use 60 percent of this untreated (except washed) bank sand and 40 percent bank sand with the minus 16-mesh removed. In other words he is to scalp the 40 percent for all its plus 16-mesh sizes. Taking the proportions

in which these sizes occur in the sieve sample, he would be adding to his bank sand as follows:

60 percent bank—plus 40 percent scalped

	Parts	Parts
Plus 4-mesh.	0.9 + 0.6	1.5
4- to 8-mesh.	3.3 + 2.2	5.5
8- to 16-mesh.	6.0 + 4.0	10.0
16- to 30-mesh.	25.8	25.8
30- to 50-mesh.	16.8	16.8
50- to 100-mesh.	6.6	6.6
Minus 100-mesh.	0.6	0.6

Totals 60.0 66.8

Imperfect Screening

The discussion in the December issue assumed this would be rough approximation of what we were seeking; and our correspondents emphasize the fact that it is a rough approximation *only*. The reasons are these: (1) we are tackling a very difficult screening problem by attempting to scalp — the (only 17

percent) of our screen feed on a relatively fine mesh; (2) the sizes

(Continued on page 104)

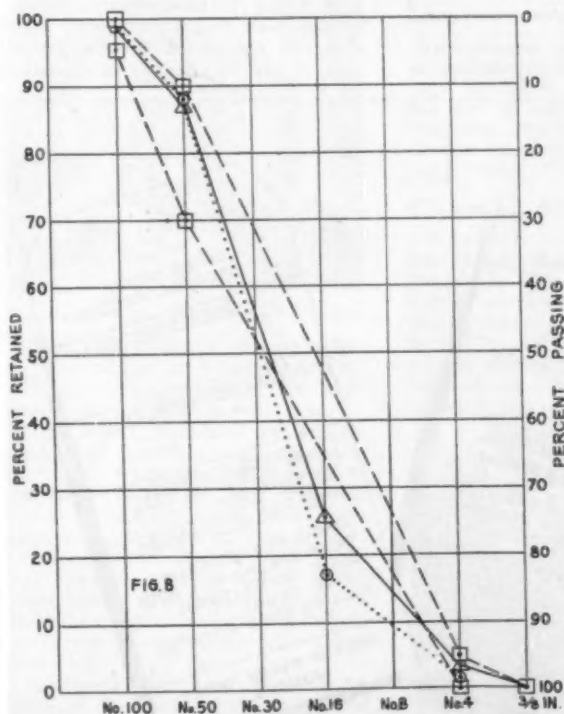


Fig. 8: Shows Connecticut specification (referred to in Rock Products, Dec., 1944, p. 55) plotted on chart in dash line. Dotted line is bank run analysis of raw material. Full line is corrected sand

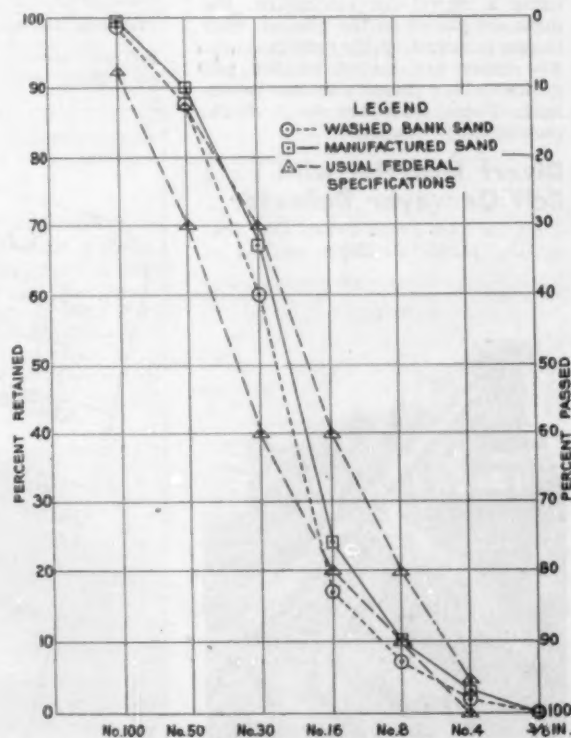


Fig. 9: Comparison of Connecticut sand, before and after, with usual Federal sand specification

HINTS *and* HELPS

Practical Ideas Developed by Operating Men

Steel Mat Truck Ramps

STEEL MATS, of the same type as those used in the South Pacific as landing mats for airplane runways,



W. E. Rogers, owner, holding landing mat which is placed on sand piles to allow trucks to travel up incline of pile

are in service at the Arkansas River Gravel Co., Tulsa, Okla., as truck ramps. To eliminate the necessity of using a shovel for stockpiling, the mats are placed on the pile, allowing trucks to travel up the pile to dump. The mats are moved as the pile grows and are placed wherever necessary. These mats are 3- x 12-ft., rectangularly shaped.

Divert Material with Belt Conveyor Deflector

At the East Texas Gravel Co., Seagoville, Texas, a simple method of



Board above conveyor belt deflects pit run gravel into chute to load trucks

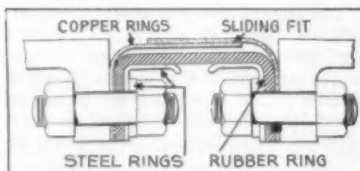
loading trucks with pit run gravel is employed. As shown in the illustration, a board is placed crosswise on the belt conveyor carrying gravel to the washing and screening plant. Gravel is deflected by this board to a chute which feeds to the trucks. Removal of the board allows the material to continue on the belt to the plant. The board is supported in the frame work of the conveyor so that it does not rub on the belt, and therefore does not create wear on the sides of the belt.

Water-Tight Joint

By W. F. SCHAPHORST

IN THE ACCOMPANYING SKETCH is shown an easily made water-tight expansion joint which a large eastern engineering concern used to solve the problem.

A rubber ring, shown in the sketch, is the water tight medium. However,



Expansion joint for water and other liquids

for oil, steam, high temperatures, etc., there are other substances on

the market which may be required. This device is strong laterally because of its telescoping copper rings which make it possible to withstand considerable pressure.

Grease Check-Up Tags

By ARTHUR C. AVRIL

IRRESPONSIBILITY of wartime labor has made it impossible to have machinery greased at the proper time, resulting in serious breakdowns. Some equipment has been greased too often and others not at all. As a result of this condition, a simple tagging system was devised which anyone could understand, provided they could read. The tags are shown in the illustration.

Since some of the greasing points are in out of the way places, tags were not attached at those points because their purpose of being a constant reminder would be nullified. It also would be difficult for management to make a quick check under such conditions.

All of the electrical controls for the equipment are on a main control panel, and are used several times each day by the workmen for starting and stopping all of the equipment. It was therefore decided to attach a tag to each control switch. If the men forget to grease each piece of equipment at the proper time, it can be checked in a matter



Greasing schedule tag (both sides) to insure proper maintenance

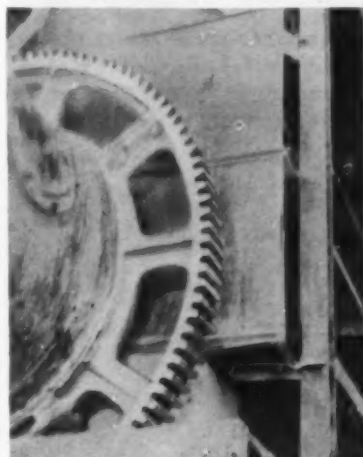
of seconds because all tags are in one location.

Comparatively indestructible linen shipping tags are being used as they are not mutilated by erasing pencil figures to change dates. Both sides of a tag are used; one for the equipment and the other for its motor. Separate records for equipment and motor are necessary because the greasing periods and instruction for greasing are entirely different. The items on the tag are self-explanatory, except the last, which in reality is a repetition of the next greasing date but it was proven necessary as a guide in establishing that date.

Since some machines must be greased daily, others weekly, monthly or quarterly, this simple system of tagging each switch on the main control panel has eliminated a serious maintenance problem.

Build Up Tube Mill Gear

In the accompanying illustration is shown a tube mill gear, the worn and broken teeth of which have been reclaimed by bronze-surfacing. As described in *Oxy-Acetylene Tips*, it is a cast iron split-gear, 9 ft. in di-



Bronze-surfaced gear after 10 years of service

ameter and weighing 5000 lb. After 10 years of service following the repair by bronze-surfacing, the gear shows relatively little wear.

This repair was made by a company that manufactures cement refractories. When the gear that drove the mill became jammed and was damaged beyond repair, the company was faced with an 8-week shut-down of the 20-ft. tube mill which was used to grind fire clay in the manufacture of refractory cement. A badly worn old gear was found in the scrap pile and steps were taken to reclaim it for use.

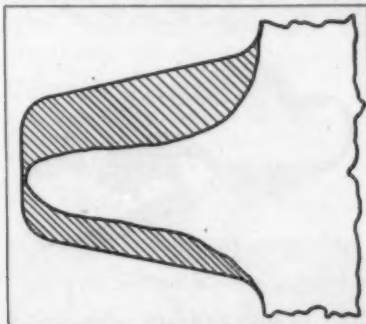
Originally, the teeth were 9 in. wide, 2 in. thick at the base, and tapered to 1 1/4 in. thick at the top. They had worn until they were approximately 1 1/4 in. thick at the base



Left: Receiving end of message carrier in mixing plant. Right: Delivery end of carrier in office



and 1/4 in. at the top. In addition to the wear, six teeth were completely broken out. Four days were required to prepare the gear and do the actual welding. No preheating was neces-



Cross-hatched areas of sketch show how much each worn tooth was built up

sary. Approximately 235 lb. of Ox-weld No. 25 M bronze welding rod was used to rebuild the teeth to original size. The bronze-surfaced gear already has outworn five cast iron gears, states the report.

Cleaning Mixer Drums

A quick and easy method of cleaning hardened concrete from transit mixers is employed at the ready mixed concrete plant of the Fort Worth Sand and Gravel Co., Fort Worth, Texas. A chip hammer, powered by an air compressor, thoroughly removes all concrete which has set in the drum.



Pneumatic chip hammer used to remove concrete which has set in mixer drum

Ready-Mix Order Carrier

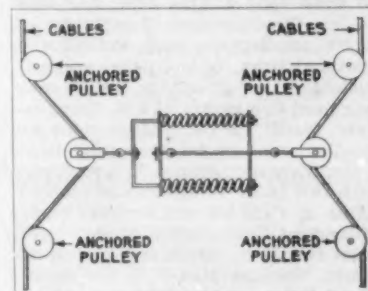
THE FORT WORTH SAND AND GRAVEL Co., Fort Worth, Texas, has a novel method of conveying order slips from the office to the ready mixed concrete plant. A Lamson Cash and Message Carrier, like those in use at Department stores, was installed for this purpose.

Orders received at the office are sent by this carrier to the mixer room and the truck ticket is sent to the driver through a 7- x 7-in. enclosed wooden chute. This method eliminates any mistakes in orders that could occur by misinterpretation or misunderstanding over the telephone.

Cable Tension Device

By J. F. PRUYN

In the illustration is shown a simple device for keeping tension on cables. It has proven very handy mainly because the spring tension



Details of spring tension device for cables

can be changed so easily by adding or removing springs. For heavy jobs another spring can be added on the center rod; for lighter jobs only one spring can be used in the center.

Other advantages of the design are: the device can be mounted in a small space at any angle; it never takes up the cable slack with a jerk; the whole rig can be made of left-overs around the plant, and no machine shop is needed. Such cable tension rigs are used on car hauls (mine cars and railroad shipping cars), trams, etc.

NEW Machinery

Light and Power Unit

DAVEY COMPRESSOR Co., Kent, Ohio, is manufacturing what has been termed the Da-V-Lite portable light and power unit wherever emergency lighting is required or for out of the



Portable light and power unit

way locations in quarries or sand and gravel pits.

This unit comprises a heavy-duty, 4-cylinder, V-type air-cooled engine which operates a Westinghouse single-phase, 60-cycle, 120-volt generator delivering 5 kw. for lighting or power. It is available in four models, any of which may be obtained with either skid mounting or spring mounted on two wheels.

The "Floodlight Model," designed to work-light a large area, has four 16-in. Westinghouse floodlights of 35,000 candlepower each, individually operated from control panel and adjustable in all directions, and it may be raised to a height of 9 ft. "Searchlight Model" is for intense light on smaller areas or for projecting light a considerable distance. It is equipped with two 18-in. Westinghouse searchlights of 1,935,000 candlepower each. "Standard Combination Model" provides two 16-in. lights and two 18-in. lights. "Beacon Model" is for directional lighting at airfields.

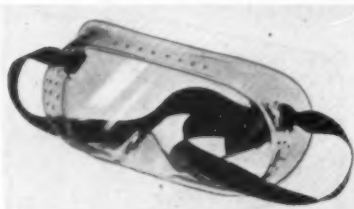
Silicone Rubber

GENERAL ELECTRIC Co., Schenectady, N. Y., is now making in a pilot plant a rubber that does not lose its stretch at temperatures as low as 60 deg. below zero or as high as 575 deg. above. The present output is now measured only in pounds, and all of it is going into high-priority war jobs. For example, it is used as gasket material for the B-29's turbo-superchargers. Synthetic rubber, such as is made in large quantities today, is elastic enough, but it is brittle after 100 hours at 300 deg. F. Sili-

cone rubber, on the other hand, is still soft after 150 hours and can be used again. In this application, it is compressed to two-thirds of its original thickness, but it returns to 90 percent of its former dimensions. In its present state of development, it is not suitable for tires and other uses where high tensile strength is required. Silica, which is one of the components of this rubber, may yet form the chemical basic element for a large number of very important and useful products.

Plastic Goggle

U. S. SAFETY SERVICE Co., Kansas City, Mo., has placed on the market a clear, non-inflammable plastic goggle. The manufacturer points out that the design allows clear vision



Goggle is molded in dies that are ground

both to the front and sides, and it can be worn over glasses. The goggle is made in both Lucite and Acetate; Lucite for super vision and Acetate for unusual strength. It is treated with "No-scratch," and is so constructed that lens does not touch surface when placed on table.

Anti-Friction Idler

LINK-BELT Co., Chicago, Ill., has brought out during the year what has been called the "100" idler. This idler has the following features:



Idler has center-roll lubrication

It has a positive grease seal to keep the grease in and the dirt out of the anti-friction bearings. Troughing rolls are accurately aligned in a streamlined steel frame. The roll shafts are locked in the frame, but may be quickly and easily removed. Interlocking nuts and yokes keep roll supporting brackets from spreading. It is equipped with pipe extensions

for safe center-roll lubrication from one end of the troughing idler unit. All rolls in each troughing idler are of the same length and interchangeable.

Portable Grease Gun

STEWART-WARNER CORPORATION, Alemite division, Chicago, Ill., has developed an electric portable, power grease gun, Model 7190, designed for high pressure lubrication with all types of lubricants that seek their own level. Equipped with large heavy duty wheels for easy mobility, operation is further facilitated by means of a ball bearing front caster in the steering mechanism.

The heavy duty, 1/2 hp. electric motor drives a high pressure grease piston and cylinder fitted to close limits to prevent by-passing. A mercury switch automatically shuts off the motor when 5000 lbs. pressure have been built up in the delivery hose. The gun has an accessible check valve and pressure release valve.

Equipment includes a 12-ft. electric cord, a 6-ft., 20,000 lb. burst



Electrically-operated grease gun

pressure hose and control valve with hydraulic coupling, combination handle, cord and hose rack. The gun stands 28 1/2 in. high, 15 in. wide, and 26 in. long.

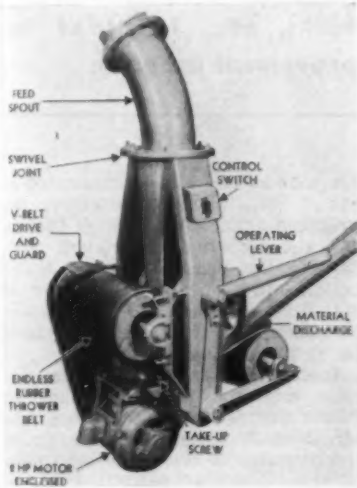
Gas Turbine Movie

ALLIS-CHALMERS MANUFACTURING Co., Milwaukee, Wis., has produced a movie about the gas turbine, one of the newest sources of prime power. The movie entitled, "Tornado in a Box," unfolds the story of the gas turbine making its principle readily understandable to the largest possible audience which could be interested in the potentialities of the new prime mover.

NEW MACHINERY

Box Car Loader

THE STEPHENS-ADAMSON MANUFACTURING Co., Aurora, Ill., has announced the "Swiveloader," for loading and trimming box cars with loose, granular, bulk material, such as crushed stone, coal, fertilizers, grain, etc., up to 2 in. in lump size. According to the manufacturer, the unit has a capacity of from 40 to 80 tons per



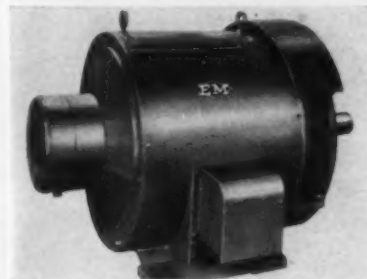
Material is discharged from belt by centrifugal force into box car

hour depending on the type and weight per cubic foot of material being handled.

The loader is installed so that it can be swung into position just inside the car door. From this position all parts of the car can be loaded by simply swiveling the thrower unit on the feed spout, from which it is suspended. It is said that placement and operation of the loader can be handled by one man with a minimum of effort. Since the operator is not required to be in the car during actual loading, dust hazards are reduced to a minimum.

High Speed Generators

ELECTRIC MACHINERY MANUFACTURING Co., Minneapolis, Minn., has brought out a line of high-speed, a.c. generators which are available in the following sizes: 18.7 to 125 kv.a., 1800



Alternating-current generator has drip-proof construction

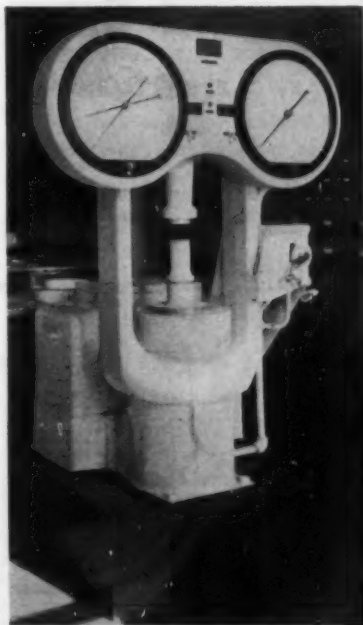
to 514 r.p.m., for standard voltages; 1, 2, and 3-phase, 50 and 60 cycles, 80 percent power factor, 50 deg. C. or 40 deg. C. rise. These generators are supplied as two-bearing units for belted or coupled duty, or single-bearing for direct coupling to driving engine. Drip-proof generator construction is standard.

Generators are also available as "packaged" units, with controls mounted on generator frame, and wiring factory-connected. Controls on these units comprise a metal enclosure, housing voltage regulator and meters. It is said that no switchgear is required; run only three wires (for three-phase) to the load through the generator switch.

A suction-type fan at the drive end of the generator pulls a large volume of ventilating air through both the direct-connected exciter and the generator. The intake of ventilating air is at the exciter end, opposite the driving engine on direct-coupled units, preventing circulation of heated air.

Cement Tester

THE BALDWIN LOCOMOTIVE WORKS, Baldwin-Southwark testing machine division, has called attention to increasing use of its 90,000-lb. Southwark-Emery compression cement



Compression testing machine for testing air-entraining cements

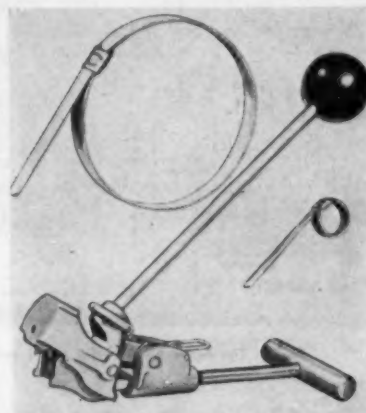
testing machine. As explained by F. G. Tatnall, head of the division, 2- x 2-in. cubes of the new air-entraining cements can be better tested in compression than in tension.

This cement tester was introduced in response to the requirements established in the early 1930's by the

Working Committee on the Plastic Mortar Cube Test of Committee C-1 of the American Society for Testing Materials, which required all possible testing refinements so as to permit distinguishing very fine points of quality difference in cements.

Tight Hose Clamp

PUNCH-LOK Co., Chicago, Ill., has designed a hose clamp which is available from 3/4-in. to 48-in. I.D., suitable for all types of hose from high pressure wire woven and braided types controlling hydraulic machines



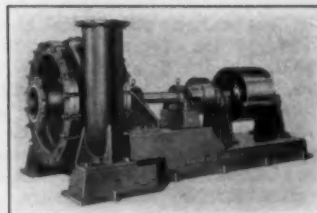
Equipment used to tighten hose clamp

to ordinary air and water hose, states the manufacturer.

In the illustration is shown the equipment for tightening the clamp. In making the connection, a broad, flat high-tensile strength galvanized steel band is double-wrapped around the joint. After tightening with a pull of 1000 lbs. within the locking tool, the ends are securely locked together under tension without loss of tension within the flat pressed-steel clip, and the excess band is cut off flush with the clip.

Dredging Oyster Shells

LAWRENCE MACHINE AND PUMP CORPORATION, Lawrence, Mass., has developed a 12-in. dredging pump which is particularly adaptable for dredging oyster shells which are used as a source of material in the manufacture of lime, cement, feeds, and highway aggregates. The illustration shows a belt driven unit.



Pump designed for dredging oyster shells

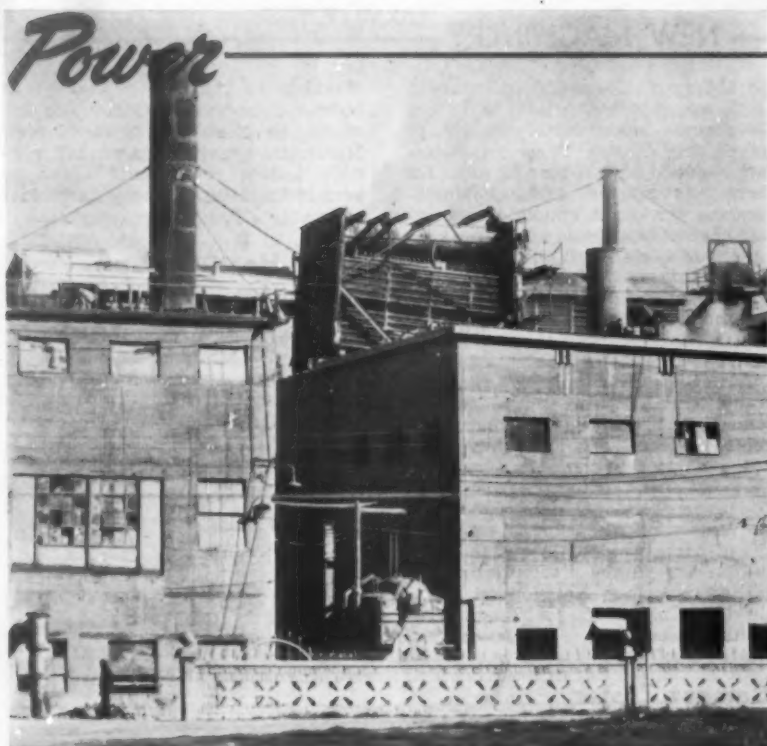


Fig. 5: The boiler house, with No. 1 boiler removed and No. 2 boiler on cribbing

Dewey Portland Cement Co., Dewey, Okla., adds new wasteheat boiler, and relocates raw mills, elevators, separators, blending tanks, etc., in plant improvement program

No. 5 and No. 6 kilns as indicated in Fig. 1. This sketch also shows the proposed change, i.e., moving the old No. 1 boiler from its original position to the position marked No. 3 boiler, and then old No. 2 boiler to No. 2, new location. Fig. 2 shows longitudinal section of the setting for new waste heat boiler.

Preliminary and final plans, designs and drawings were made by Victor Torres, chief draftsman, and Mr. John W. Tyler, assistant, under the direction of the writer, and Geo.

Boiler Revamping and Expansion Program

By C. E. KIETZMAN*

was to have all the latest designs and improvements.

It was also planned to place this boiler in a position in direct line with

W. Cross, superintendent, subject to the approval of D. M. Tyler, vice-president and general manager.

The plan also called for moving and relocating three raw grinding tube mills, three elevators, three air separators, two raw feed tanks, two

In the Spring of 1940, the management of Dewey Portland Cement Co. decided on an expansion and improvement program involving the waste heat boiler system at the Dewey, Okla., plant. A definite plan was agreed upon by the engineering department and the management and the preliminary work of engineering was begun, after the waste heat systems in several cement plants, both near and in the East, had first been examined.

The old heat and power system consisted of six kilns, a long flue above the kilns (high-flue) at right angles to the kilns and three 1088-hp. Edge Moor boilers installed on the ground floor and at right angles to the above mentioned long flue. The accompanying diagram, Fig. 1, shows the relative positions of the equipment.

After definite decision was made to proceed with the program, which included an additional boiler, a contract was signed with Edge Moor Iron Works, Inc., for a 1088-hp., 200 lb. W.P., 100 deg. F. superheat, W.T. boiler, type 22-3-22, 21 ft. 40 in., with a total water heating surface of 10879 sq. ft. This boiler was to be a duplication as near as possible of three boilers which had been in operation for the past 20 years. It

*Assistant superintendent, Dewey Portland Cement Co., Dewey, Okla.

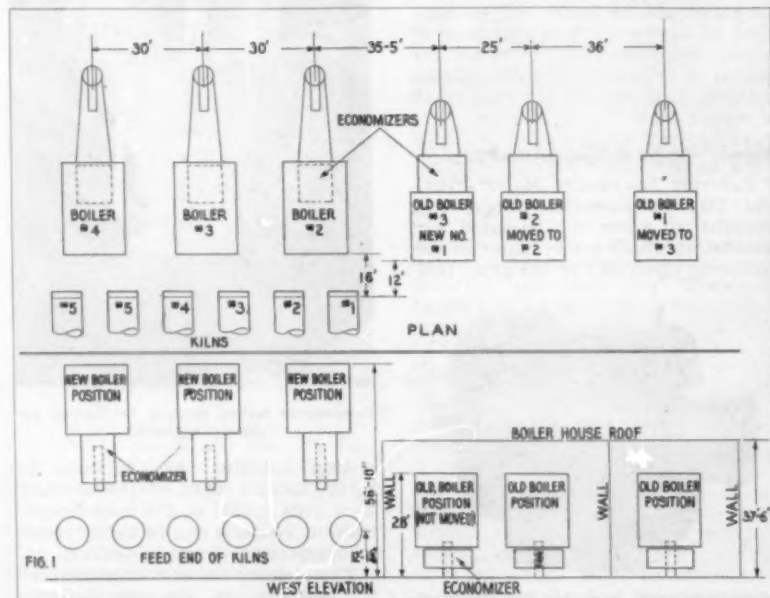


Fig. 1: Location of boilers with respect to kilns

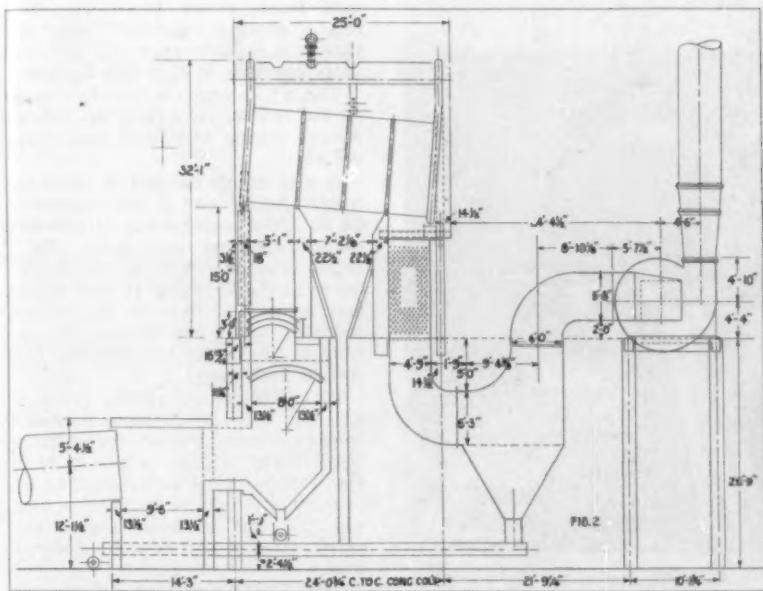


Fig. 2: Longitudinal section showing setting for new waste heat boiler

pumps for conveying the raw product to the blending tanks, and all the other necessary appurtenances.

It so happened that the No. 4 boiler foundation could be located without disturbing any of the principal machinery in the raw department. Work on the No. 4 foundation was begun in the late Fall of 1940 and the concrete foundation, as shown on Fig. 3, was poured in the early months of 1941.

This boiler was finally erected and placed in operation approximately January, 1942, and operated continuously until our next shutdown, Jan. 27, 1944, a period of approximately 25 months. The addition of this unit greatly improved our power problem. The additional steam generated with the same number of kilns completely

justified our move in this direction. Previous to this time our steam generating capacity determined the kilowatt hour load we could carry. With the additional boiler capacity, the two turbines, 3000 k.w. and 3200 k.w. capacity, are operated at full load and overload, and are the determining factor in our maximum power load. For many months at a time our kilowatt-hours load ranged from



Fig. 5: Cribbing for raising No. 1 boiler 38 ft. preparatory to moving the boiler 150 ft.

144,000 kw.h. to 152,000 kw.h., per 24 hours.

During the period of operation from January 1, 1942, to January 27, 1945, preparations were made to relocate our raw tube mills and their appurtenances to make way for relocating the two old No. 1 and No. 2 boilers. This consisted of constructing a new building, installing tube



Fig. 4: This view shows the position of the boiler before removal

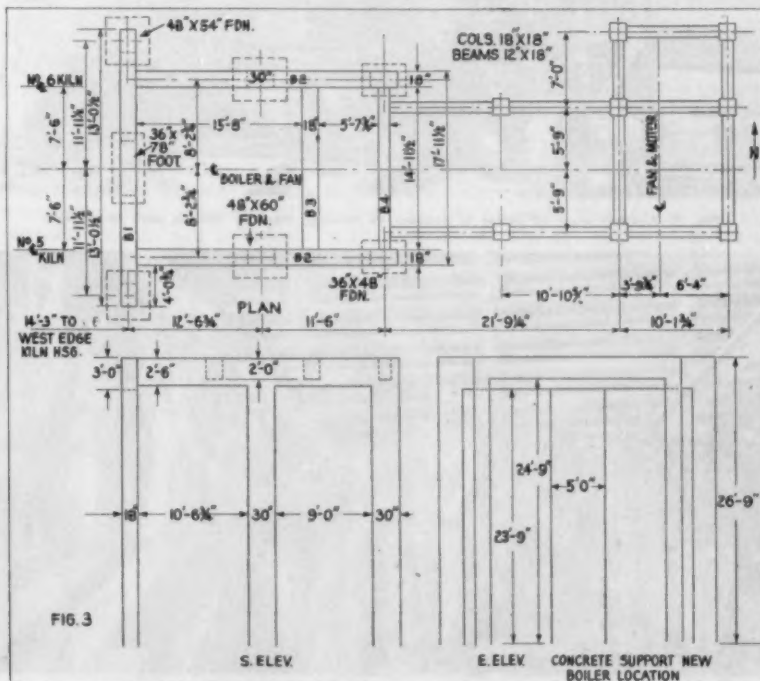


Fig. 3: Plan and elevation drawing for concrete foundation to support boiler



Fig. 7: No. 2 boiler in position ready to be pulled off cribbing into permanent position across the roof



Fig. 8: Cradle, bracing and lifting brackets, used in moving boiler

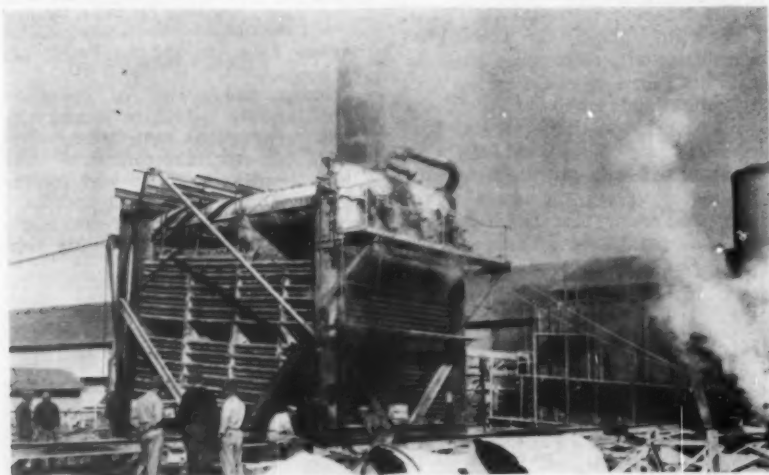


Fig. 9: Another view of boiler in process of moving, showing 100-ton jack in position



Part of crew that moved No. 2 boiler. E. R. Check, chief engineer, who was in charge of job, is on extreme right. Next to him is Oscar Mayberry, his assistant

mill bases, motor bases, etc., and finally moving one feed tank, one tube mill, an air separator and elevator previous to February 1, 1944.

The major problem that now faced us was that of relocating the two old boilers during the next shut down period.

It was finally decided to move the boilers bodily and it was agreed to do so under supervision of our own plant personnel and labor. No. 1 boiler was the first to be moved. Since an undertaking of this nature was something new in the cement industry, to our knowledge, and possibly in any other industry, we proceeded cautiously.

With the method chosen for moving this boiler, it became necessary to obtain much timber for cribbing. No. 1 boiler had to be raised 38 ft. (see Fig. 5) and then be skidded approximately 150 ft. to its new location. To raise the boiler necessitated going directly through the concrete roof.

The cribbing required to do this job consisted of six carloads of 8-in. x 14-in. x 28-ft. (approximately 300 pieces) bridge timbers rented from the Atchison, Topeka and Santa Fe Railroad; two carloads of 3-in. x 12-in. x 18-ft. planks purchased from our Davenport, Iowa, plant; approximately 6000 railroad ties; 35,000 board feet of 3-in. x 8-in. x 12-ft., and over, native timbers; and possibly an additional 4000 board feet of 2-in. x 12-in. x 18-ft. pine planks. Fig. 5 shows the method of cribbing used and gives some idea of the magnitude of the undertaking.

The boiler, together with the 10-in. H-beam cradle and bracing used in moving it, weighed approximately 150 tons. This cradle, bracing, etc., was all fabricated by our own man, Mr. Chester Wright and is plainly shown in Fig. 9. This illustration also shows the lifting brackets, one at each corner, bolted and welded to the boiler 10-in. H-beam leg. It also shows the location of cradle with respect to the boiler tubes. Fig. 4 shows the position or height the boiler was cut off from its original position on the main floor. Four 100 ton hydraulic jacks were used, one at each corner and provision was made to handle each jack with individual rope blocks.

Fig. 6 shows the boiler room, with No. 1 boiler already removed and the roof slab replaced and No. 2 boiler setting on its cribbing, ready to be moved north approximately 50 ft. to its new location.

Both boilers were raised to the necessary height in approximately five to six weeks, including the making of the cradle, etc. The moving, or skidding, of boiler No. 2 north did not require much time. Six 10-in. H-beams 64 ft. in length were used as track and the boiler placed on numer-

(Continued on page 92)

Excavation

Two-Shift Operation Cuts Costs

Blue Diamond Corporation excavates sand and gravel at night, and moves material to plant during the day



Dragline with long boom excavates material from pit at night, and during the day fills field hopper from drained stockpiles from which it is transported to screening plant by belt conveyor

AGGREGATE production by the Valley Park plant of the Blue Diamond Corporation at El Monte, Calif., over a period of years has lowered the floor of operations to the 35- to 80-ft. level in the 65-acre pit. Which means, because of its location in the old San Gabriel river bed, ground water has been reached.

Exploration drilling confirmed the continued depth of the gravel deposit. To continue operations at a low cost level and to eliminate the prospective use of a longer conveyor system, the management put into use a two-operation system of pit material handling to field hopper.

Working two 8-hour shifts, the night operations are devoted to getting the pit-run mixed gravel and sand into stockpiles for draining. This is done with an electric Link-Belt Speeder dragline having a $2\frac{1}{2}$ -cu. yd. Page automatic bucket. Recovery is made on the day shift, the Speeder's 60-ft. boom rehandling the material from stockpiles to the circular 4-cu. yd. field hopper. Daily production of aggregate has reached the 2000-ton mark.

Like many of the numerous crushed rock producing plants in the foothill area, the Diamond operation is of a dual nature—the production of both uncrushed and crushed rock or gravel. The plant design (see *Rock Products*, July, 1941, p. 46) is such that any of the in-demand grades and sizes of rock and sand can be produced in the desired sizes of ma-

By JIM MEDFORD

terial, and always in reserve are stockpiles of the various sizes. This can be done because stockpiles of the various sizes are always in reserve for supplying any demand that may be added to the 2000-ton daily capacity of plant. These stockpiles are built up as deliveries permit.

Overburden is light, probably the depth is not more than a foot from grass roots to usable material. Removal of this overburden is by tractor with bulldozer. Gravel deposit runs about 30 percent sand and of the 70 percent gravel, approximately half is plus $1\frac{1}{2}$ in. with very few boulders, those not exceeding 10 to 12 in. Foreign material is almost totally lacking. This is typical of these dry-wash deposits.

Plant operations are handled by a maximum of four men—one each for dragline, conveyor system, plant and scale. Some plants in the area are now at the 100-ft. level without hitting water. But this is about the generally accepted limit in depth for minimum economical operation. However, the ground water is erratic and is encountered at various depths, one company dragging from flooded areas at 60 ft. Ground water varies in all pits in this area from 20 to 90 ft. below surface.

Two 36-in. Conveyor Co. belt conveyors connect the field hopper with the sizing plant. The hopper is moved by the Speeder dragline as digging proceeds. The pit conveyor is made flexible by movable sections to compensate for a change in dragline position.

Material is discharged from the field hopper to the Goodyear belt



Truck and trailer delivery unit is of the most efficient type

EXCAVATION

by a Conveyor Co. reciprocating-plate feeder. Feed is regulated by suspended counterweighted steel fenders to bar grizzly set at 1½ in. to place fines on belt ahead of plus material, avoiding excessive wear to now hard-to-get rubber belts.

Screening and Crushing

From pit conveyor, material is dumped through hopper to plant conveyor, making a total present operating conveyor length of 750 ft., pit hopper to plant discharge. At the plant this material is fed to a 4- x 10-ft. Allis-Chalmers two-deck scalping screen feeding the double-system conveyor elevators—gravel to one side of plant, crushed rock to other.

Two screen sizes are used on each deck, 1¼- to 3½-in. on upper and ¾- to 1½-in. on lower. The finer material below ¾ in., around 20 tons per hour, is chuted to a hopper where water supplied by discharged wash water flows this material to waste pile. A flop valve makes possible the diversion of this material to the sand and gravel flow from the 1½-in. section. When extra dry the waste material may exceed the 20-ton per hour rate. Under such conditions up to double the amount may be diverted to waste, if and when necessary.

Two 36-in. Traylor gyratory crushers of variable diameters receive the passed material from the two decks. Discharge is to a 24-in. belt conveyor, 30-ft. centers, feeding the 4- x 14-ft. Allis-Chalmers two-deck preliminary screen with ¾-in. topside mesh and three sections for Nos. 3, 4 and 5 sizes, and dust, on lower, all discharging into bins below.

Dust elimination is close to 100 percent by the use of enclosures around crushers, elevators and screens with a 35-in. Buffalo fan working through a 7-ft. cyclone depositing it into dust bins. Crushers, elevators and screens, as well as the air, is dust free, a feature desired in every plant.

Passed material over top section of preliminary screen is chuted to a single-deck 4- x 14-ft. Allis-Chalmers screen for sized crushed rock up to 2½ in., or No. 1. By-passed material feeds back to one of the Traylor crushers and a 322 R Allis-Chalmers crusher.

The second of the two 90-ft. belt-bucket elevators receives the minus 1½-in. material passing the bottom deck scalping screen, feeding it to the washed sand and gravel department. Preliminary sizing is by a two-deck, 4- x 10-ft. Allis-Chalmers

screen with 5/16-in. mesh used on top deck and 3/16-in. on the bottom deck when concrete sand is wanted.

Plaster sand is made with a top screen of ¼-in. and bottom screen of ⅛-in. Close control of made sizes is by means of hoppers with movable partitions placed under screens.

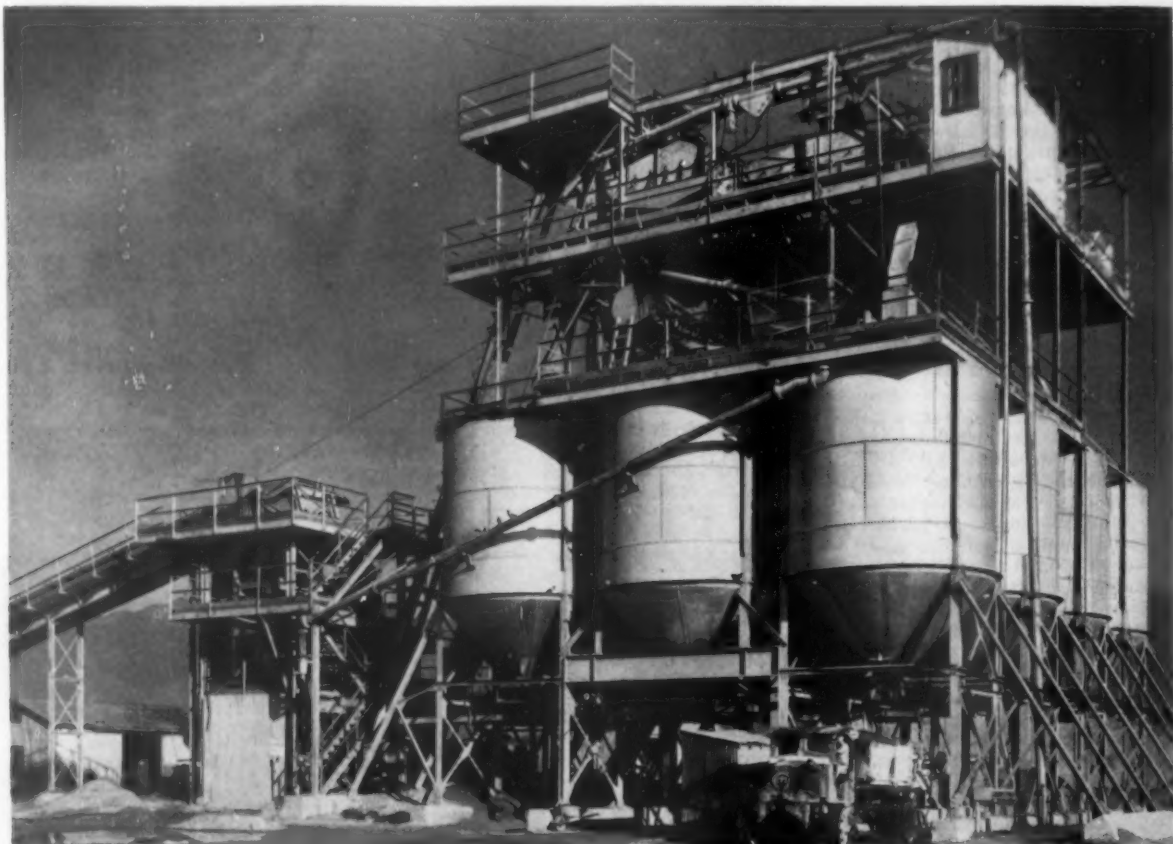
Discharged sand from the dewatering hopper moves into a 4- x 20-ft. sand drag from where it is divertible into either of three plant bins. The overflow from sand drag and dewatering hopper is flumed to pit sump for settling.

Retained material of the preliminary sizing screen's lower deck is pea gravel deposited in a separate bin. The top-deck passed gravel goes to a 4- x 14-ft. Allis-Chalmers screen for sizing.

Eliminate Screen Vibration

Vibration in plant is overcome by the use of coil springs and cable suspension of all screens. Because of ample height of all sizing screens above the plant bins, discharged material from any screen can be passed to any bin in the plant. This makes possible any combination of sizes to meet consumer demand.

(Continued on page 98)



Close-up of screening plant. Note ample headroom for screens and large steel bin capacity below

Sand and Gravel

Preparing for Post-War Business

Director of National Sand and Gravel Association hold business sessions in New York City, January 22 and 23

IN lieu of the annual convention of the National Sand and Gravel Association scheduled to be held in New York City, January 24-26, an open meeting of the board of directors was held there on January 22 and 23. Attending this meeting were 22 directors and about 40 producer guests. Some few features of the projected convention program were included, but the larger part of the meeting was devoted to routine business of the association and informal discussion of industry problems.

All members of the Association, in accordance with traditional policy, were invited to attend. Approximately one-quarter of the total attendance was from the metropolitan New York area.

Three of the outstanding talks and papers originally scheduled for the convention were presented in an afternoon session, January 24, following a joint luncheon of the Boards of Directors and guests of the National Sand and Gravel Association and National Ready Mixed Concrete Association which met January 24 and 25.

THOMAS S. HOLDEN, president, F. W. Dodge Corp., New York, N. Y., spoke on the subject, "Construction in 1945." COL. WILLARD T. CHEVALIER, publisher, *Business Week*, also of New York City, gave an inspiring talk entitled "An Appraisal of Post-war Trends." The third speaker, G. DONALD KENNEDY, vice-president, Automotive Safety Foundation, Washington, D. C., discussed "The One Percent Highway System," which will appear in the March issue.

Safety Trophies

Presentation of the National Sand and Gravel Association safety trophies was made to the winners of the 1943 competition conducted in co-operation with the U. S. Bureau of Mines.

The trophies, awarded by ROCK PRODUCTS annually, were manufactured of architectural concrete using colored aggregates to depict the prize-winning plants. W. A. Bliss, Dravo Corp., Pittsburgh, Penn., accepted the trophy in behalf of his company's Pittsburgh River plant, winner of the competition in the big plant competition. W. H. Klein, Dixie Sand and Gravel Corp., Chattanooga,

Tenn., accepted the trophy for the winning plant in the smaller plant competition for operations with less than 100,000 man-hours.



Robert Mitchell, renominated for president

A resolution was passed that the Association forward its respects to the families or associates of members who had passed on during 1944 and, at President Mitchell's request, all stood in silence in tribute to the departed members. It was also resolved that a joint committee on labor relations be appointed, with representation from the National Ready-Mixed Concrete Association.

ROBERT MITCHELL, president, Consolidated Rock Products Co., Los Angeles, Calif., was nominated for re-election to the presidency of the National Sand and Gravel Association; R. N. Coolidge, Nashville, Tenn., was nominated for vice-president; and H. N. Snyder, Buffalo, N. Y., was nominated for re-election as secretary-treasurer. The nominations were submitted to the membership for letter ballot.

The executive committee, elected by the Board of Directors, comprises T. E. Popplewell, Fort Worth, Texas; George W. Renwick, Chicago, Ill.;

A. R. Shiely, St. Paul, Minn.; and H. S. Davison, Pittsburgh, Penn.

Floyd C. Fuller, Portsmouth, Ohio; J. P. Eyre Price, Scranton, Penn.; Stephen Stepanian, Columbus, Ohio; and Eric W. Ryberg, Salt Lake City, Utah, were re-nominated and H. S. Davison, Pittsburgh, Penn., was nominated for directors at large. These nominations were submitted to the membership for letter ballot.

A meeting of the Manufacturers Division was held and the 1944 officers were nominated for re-election. Chairman of the Division is Theodore Aulmann, Eagle Iron Works, Des Moines, Iowa. Vice-chairmen are J. Harper Fulkerson, Cross Engineering Co., Carbondale, Penn.; E. J. Goes, Koehring Co., Milwaukee, Wis.; Abe Goldberg, Allis-Chalmers Manufacturing Co., Milwaukee, Wis.; L. W. Shugg, General Electric Co., Schenectady, N. Y.; Frank B. Ungar, The Ludlow-Saylor Wire Co.; and F. O. Wyse, Bucyrus-Erie Co., South Milwaukee, Wis.

Reports of the National Ready Mixed Concrete Association Board meetings will be published in the March issue of ROCK PRODUCTS.

Registration of Producers

Bird, Paul P., Boston Sand & Gravel Co., Boston, Mass.
Bliss, W. A., Dravo Corp., Pittsburgh, Penn.
Brown, Stuart, Dravo Corp., Pittsburgh, Penn.
Browning, C. G., Lehigh Portland Cement Co., Allentown, Penn.
Bryce, A. J., Certified Concrete Co., St. Paul, Minn.
Caldwell, H. P., Ohio River Sand Co., Louisville, Ky.
Chubb, J. H., Penn-Dixie Cement Corp., New York, N. Y.
Clark, Claude L., Ohio Sand & Gravel Assn., Columbus, Ohio.
Cooper, J. S., Memphis Stone & Gravel Co., Memphis, Tenn.
Coppock, F. D., American Aggregates Corp., Greenville, Ohio.
Dann, Alex., Dravo Corp., Pittsburgh, Penn.
Davison, E. K., J. K. Davison & Bro., Pittsburgh, Penn.
Dixey, Joseph H., J. H. Dixey Co., New York, N. Y.
Durland, D. D., Durland Sand Co., Wyoming, Penn.
Ferber, Herman B., Tidewater Stone & Supply, Hackensack, N. J.
Foland, D. S., Keystone Gravel Co., Dayton, Ohio.
Foster, Alexander, Jr., Warner Company, Philadelphia, Penn.
Fuller, F. C., Portland Sand & Gravel Co., Portsmouth, Ohio.
Giles, Wm. S., Iron City Sand & Gravel Corp., Pittsburgh, Penn.



Alex. Dunn, to the left, and J. P. Price

Hilton, Alfred N., Southern Materials Corp., Norfolk, Va.
 Hummer, John W., Portland Sand & Gravel Co., Portland, Penn.
 Jahncke, Walter F., Jahncke Service, Inc., New Orleans, La.
 Johnson, Alexander, Central Concrete, Inc., Brooklyn, N. Y.
 Johnston, V. O., Lincoln Sand & Gravel Co., Lincoln, Ill.
 Kelly, Frank L., Colonial Sand & Gravel Co., New York, N. Y.
 Klein, W. H., Dixie Sand & Gravel Corp., Nazareth, Penn.
 Lucas, J. P., Ohio River Sand & Gravel Corp., Parkersburg, W. Va.
 McCarthy, R. J., Hodgson Sand & Gravel Co., Morristown, N. J.
 McCracken, J. P., American Builders Supply Co., Louisville, Ky.
 McCue, Timothy P., Warner Co., Philadelphia, Penn.
 Miller, D. J., Portland Sand & Gravel Co., Portland, Penn.
 Mogan, J. T., Consolidated Sand & Gravel Ltd., Toronto, Ontario, Canada.
 Murphy, James F., Gallagher Bros. Sand & Gravel Corp., New York, N. Y.
 Nunan, E. J., Buffalo Slag Co., Buffalo, N. Y.
 Osterholz, H. D., Lehigh Portland Cement Co., New York, N. Y.
 Owens, H. V., Eastern Rock Products, Inc., Utica, N. Y.
 Pelsue, H. P. G., Metropolitan Sand & Gravel Corp., New York, N. Y.
 Pederson, J. J., Pederson Bros., St. Paul, Minn.
 Popplewell, T. E., Ft. Worth Sand & Gravel Co., Ft. Worth, Texas.
 Price, J. P., Wyoming Sand & Stone Co., Scranton, Penn.
 Reid, J. H., Consolidated Sand & Gravel Ltd., Toronto, Ontario, Canada.
 Reynolds, D. D., Boston Sand & Gravel Co., Cambridge, Mass.
 Ryberg, Eric, Utah Sand & Gravel Products Corp., Salt Lake City, Utah.
 Shiely, A. R., J. L. Shiely Co., St. Paul, Minn.
 Shirey, C. W., C. W. Shirey, Waterloo, Iowa.
 Snyder, Harris N., Buffalo Slag Co., Buffalo, N. Y.
 Spratlen, F. P., Jr., Ready Mixed Concrete, Denver, Colo.
 Thomson, H. F., General Material Co., St. Louis, Mo.
 Warner, Irving, Warner Co., Philadelphia, Penn.
 Warren, Ray V., Pennsylvania Sand & Gravel Products, Pittsburgh, Penn.
 Wing, W. S., Dixie Sand & Gravel Co., New York, N. Y.

Report of Director of Engineering

STANTON WALKER, director of engineering, National Sand and Gravel Association, presented his report at



In this group may be seen Paul Bird, left, and E. J. Nunan

the Directors' meeting, summarizing the activities which have been under his direction. It is of interest to note

that Mr. Walker is starting the 20th year of service to the Association in this capacity. He reviewed his work as a representative of the industry in national engineering groups on more than 30 committees and sub-committees. He referred to typical cases of service to individual companies or groups of companies, mentioning specifically his appearance before the New York State Highway Department and the Departments of Parks and Public Works of the City of New York at which the question of a broader use of gravel in concrete pavements was discussed; a similar appearance before the Connecticut state officials; the discussion of grading specifications for fine aggregate with the Illinois Highway Department, and the more extensive use of gravel in bituminous mixtures discussed with the Kentucky Highway Department. He also referred to his trip to visit West Coast properties.

Mr. Walker referred to the expansion of research activities in the association laboratory at the University of Maryland in cooperation with the National Ready Mixed Concrete Association, and said that Delmar L. Bloem had joined the staff on January 2, at the recommendation of Iowa State College. He reviewed the series of tests which have been conducted, the results of which have been publicized throughout the industry in association circulars and bulletins. Mr. Walker also proposed to carry on additional research work in studies of adhesion of bitumen to aggregates, the problem of chemical reactions between aggregates and cements, and studies of the problem of sand grading.

Bituminous Mixes

An afternoon session was devoted to a discussion of bituminous mixtures, with principal emphasis on the stripping of aggregates and acceptability of natural aggregates.

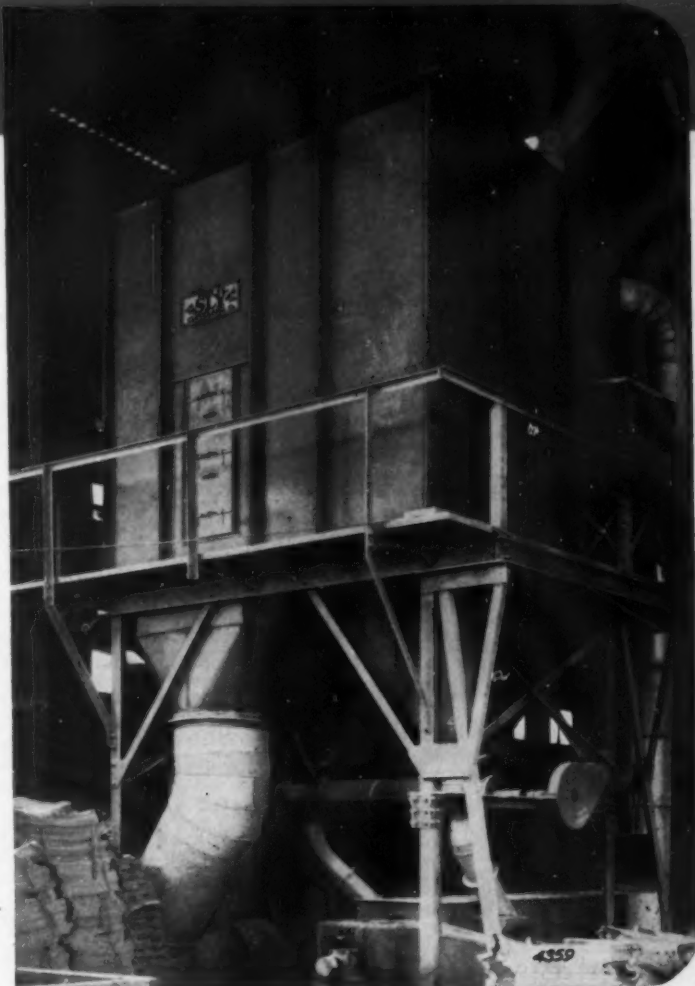
(Continued on page 71)



Two Canadian visitors, J. H. Reid, left, and J. T. Mogan, Consolidated Sand & Gravel Ltd., Toronto

SLY DUST Control

Widely Used... *Not Expensive*



This is a typical Sly installation. Literally, hundreds of similar installations are in use in connection with production of cement, crushed stone, agricultural limestone, gypsum, asbestos, talc, feldspar, fluor spar, gold, copper and iron ore, diatomaceous earth, bauxite, etc.

Sly Dust Filters collect dust generated in such operations as crushing, grinding, screening, conveying, loading, separating, and mixing. They comply fully with the requirements of the laws and regulations of the various states.

Illustration at left shows a Sly Dust Filter in the pack house of a cement plant. Several dust pipes enter the far side of the filter. The exhaust fan is located on the floor below filter. A screw conveyor automatically and continuously removes the collected cement. Hundreds of similar Sly Filters are used in cement plants and other rock product industries.

Inexpensive to install and maintain, Sly Dust Control systems soon pay for themselves. Ask for Bulletin 98 and tell us your problem so that we can write you fully.

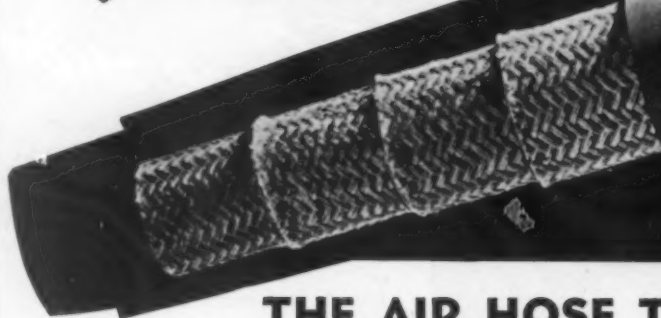


THE W. W. SLY MFG. CO.

4746 TRAIN AVENUE
CLEVELAND 2, OHIO



Tower



REPUBLIC RUBBER
TOWER PNEUMATIC
OIL RESISTING TUBE
YOUNGSTOWN, OHIO



THE AIR HOSE THAT IS MADE
Tough INSIDE AND OUT

Tower Air Hose is "better than before" . . . recently improved through application of technological advances in synthetic rubber. This tough, rugged hose will take severe abuse in quarrying and similar services, yet it is flexible and easy to handle. Its tube is compounded to resist oil and heat. Special braided cord reinforcing adds flexibility and strength for resistance against high working pressures, shock and crushing. The tough, abrasion-resisting cover will stand dragging over rock, concrete and steelwork. For outstanding performance and economical service, ask your nearby Republic Distributor for Tower.



WE ARE
PARTICIPANTS IN THE
OWNERSHIP AND OPERATION
OF
NATIONAL SYNTHETIC RUBBER
CORPORATION

REPUBLIC RUBBER

DIVISION
LEE RUBBER & TIRE CORPORATION
YOUNGSTOWN 1, OHIO

REPUBLIC INDUSTRIAL PRODUCTS
YOUNGSTOWN, O.



LEE DELUXE TIRES AND TUBES
CONSHOHOCKEN, PA.

BERNA
chief
tute.
Walke
answe
RAY
vania
Assoc
been
sand
way
practi
partm
recen
succes
recog
outloo
optim
Mr
done
engin
said
be ca
Assoc
select
there
bitum
woul
prev
omy
haul
ence
calit
anoth
ment
wide
satis
end
In
wher
used
the
come
com
the

Bituminous Mixes

(Continued from page 68)

BERNARD GRAY, general manager and chief engineer of the Asphalt Institute, was prevailed upon by Stanton Walker to lead the discussion and answer questions.

RAY V. WARREN, Western Pennsylvania Sand and Gravel Producers Association, said that there have been objections to the use of natural sand in bituminous mixes for highway construction in Pennsylvania practically since the Highway Department was organized, but that recently this use of sand has been successful in gaining experience recognition. His opinion is that the outlook for natural asphalt sand is optimistic.

Mr. Gray told of the work being done by the Asphalt Institute in engineering and development and said that research on aggregates will be carried on cooperatively with the Association. In commenting on the selection of aggregates, he said that there would not be much volume of bituminous mixes unless natural sand would be used. Natural sand being prevalent, he emphasized that economy is important where length of haul is a factor. He said that experience with natural sand in one locality will not necessarily apply in another area. As an example, he mentioned that aggregates with widely differing absorption may prove satisfactory. The chief concern is the end product.

In reply to a question on stripping where highly siliceous aggregate is used, the opinion seemed to be that the importance of stripping will become a thing of the past. Mr. Gray commented that the trend will be in the direction of treating aggregates

against stripping at the plant, using high viscosity asphalts. Because of varying characteristics of aggregates, and the treatment desired, he said that it would be too costly to treat the bitumen.

In conclusion, Mr. Gray predicted that within the next 15 years there will be developed new applications for bituminous mixes in water and erosion control, revetments, the lining of river banks and reservoirs, that will become as important in volume as the entire volume used in road construction.

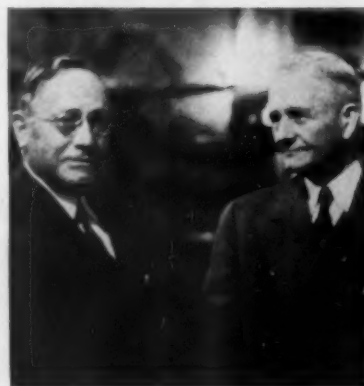
STANTON WALKER asked a number of producers to comment on any changes in aggregate specifications for asphalt mixtures. F. D. COPPOCK, American Aggregates Corp., Greenville, Ohio, reported a sizeable increase in the demand for asphalt aggregates in the midwest. The trend in some sections has been from a requirement of 90 percent crushed particles down to 65 or 70 or 75 percent. The volume was increased because asphaltic concrete was actively pushed from asphalt plants installed at gravel plants.

E. J. NUNAN, Buffalo Slag Co., said that crushed stone, slag and gravel aggregates are included in the tentative specifications in his area and that there is a tendency to permit wider use of gravel.

H. V. OWENS, Eastern Rock Products, Inc., Utica, N. Y., was asked to comment on the functioning of the sales construction department of his company, set up to promote and service asphaltic concrete jobs. This department shows purchasers how to use the product and how to place it. The volume of sales by his company increased 12,000 tons in one year through supervision and "contract work," he said. Mr. Owens said that small municipalities in particular require teaching and supervision until their engineers and supervisors gain experience with asphaltic concrete.

In reply to a comment by H. F. G. PELSUE, Metropolitan Sand and Gravel Corp., New York City, that variations in angularity of aggregates in different size ranges are important, Mr. Gray said that the only criterion for stability is to measure it. Having found commercially available deposits, Mr. Gray would recommend that trial mixes be measured for stability and the size ranges adjusted according to results.

In reply to what action is being taken to stabilize aggregates specifications, Stanton Walker said that the many types of mixes being used govern. In tight mixes, the fines govern stability while, in open mixes, angularity of aggregate governs.



Walter Jahecke, left, and Fred Coppock

ROBERT MITCHELL, Los Angeles, Calif., president of the association and chairman of the board of directors, in a brief introductory address congratulated the members on the excellent year's record of association activities, and explained the reasons for cancelling the convention.

Excess Profits Tax Relief

ROBERT ASH, attorney-at-law, Washington, D. C., who is acting as counsel of one or more sand and gravel producers in tax cases, read a paper which contains a great deal of helpful information on the possibilities of recovering some of the excess profits tax because of excessively rapid exhaustion of the sources of supply.

Mr. Ash reviewed the provisions of the present Internal Revenue Code, particularly Section 735, which deals with excess-profits tax relief. He explained that the intent of Congress in passing the Act was primarily to take excess profits from war industries. To do this it is necessary to have a measure of "normal" profits for each tax payer. Two yardsticks of "normal" earnings were established: (1) percentage of invested capital; (2) generally speaking, 95 percent of the corporation's average annual earnings for the base period of 1936-1939.

It was realized at the time there must be exceptions, particularly in the cases of producers of exhaustible natural resources, the difference between such a producer and a mercantile corporation being that when a natural resource is exhausted the producer must find another or go out of business, very probably at a greater first cost and a greater cost of exploitation.

Hence, when war industry or military construction calls for rapid exhaustion of a sand and gravel deposit the producer, who expected to use it as the basis of his business for many years to come, is not getting an excessive profit when he exhausts his resources in two or three years.

(Continued on page 74)



Garvin Pelsue



Cleaner engines, less wear, lower maintenance costs
with GULF DIESELUBE H.D.

... the improved heavy-duty oil for trucks and tractors

HERE'S THE OIL that sets a new standard of performance for truck and tractor service. Gulf Dieselube H.D. is especially manufactured for lubrication of automotive type Diesel engines, and for gasoline engines operating under heavy-duty conditions.

Gulf Dieselube H.D. is a quality lubricating oil of the improved detergent type — helps keep motors clean, and rings free. It holds carbon and sludge forming materials in suspension, thus preventing harmful deposits in the crankcase and on rings and pistons. It is noncorrosive to all types of alloy bearings, including copper lead and cadmium silver.

U. S. Army Specification 2-104B for heavy-duty

motor lubricating oil is met in every respect by Gulf Dieselube H.D., and large quantities of this oil are being used in practically all war theaters from the Arctic to the Tropics in all types of Army motorized ground equipment—both Diesel and gasoline engines—in trucks, busses, jeeps, tanks, tractors, ambulances and other service vehicles.

This high quality oil is giving outstanding results in all types of contractors' motorized equipment, and in many commercial bus and truck fleets, Diesel powered or equipped with gasoline engines operating under heavy-duty conditions.

To get Gulf Dieselube H.D. now, write, wire, or phone your nearest Gulf office—available in 30 States, Maine to Texas.

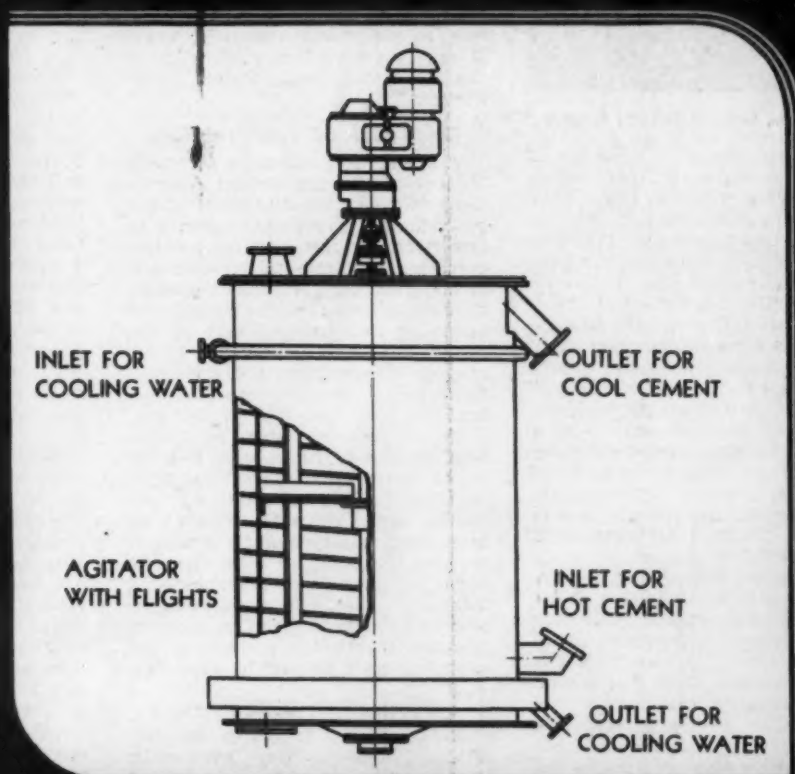
GULF OIL CORPORATION • GULF REFINING COMPANY

Division Sales Offices:

Boston • New York • Philadelphia • Pittsburgh • Atlanta
 New Orleans • Houston • Louisville • Toledo



FOR COOLING HOT CEMENT



Cement manufacturers are frequently confronted with the problem of cooling hot cement to temperatures acceptable when making bulk shipments or for immediate packing in paper bags. The FLS Cement Cooler was especially developed for cooling hot cement. • The FLS Cooler consists of a tank, water-cooled externally, the cement being introduced into the bottom and conveyed in a thin layer along the inside of the water-cooled wall to the top, where it is discharged. Thus an intimate contact is established between the cement and the water-cooled surface, assuring high-cooling efficiency. • In addition to cement, the Cooler is applicable to many other similar dry pulverized materials.

F. L. SMIDTH & CO.

Designers of Cement Making Factories, Manufacturers
of Machinery for Making Cement and Lime, etc.

60 EAST 42nd STREET

NEW YORK, N. Y.



V. P. Ahearn, left, and Frank P. Spratlan

As Mr. Ash put it: "Producers of depletable products, if they helped the war effort, would in effect have their reserves confiscated. Section 735 of the Revenue Act of 1942 was designed to give relief to such producers. The key to the producer's relief is in the calculation of "normal" income, and it is here that he needs expert advice and legal counsel.

There is not space in this report to go into all the details involved, as given by Mr. Ash in his paper. Many of these will have to be left to a later issue. He gave several examples which illustrate cases where some of tax may be remitted or recovered, which are much more easily understood than the abstract phrases in the law itself.

Another point difficult for the layman to grasp is the definition in the law of a "mineral property." Mr. Ash went into this in considerable detail in order to stress the fact that it is only in exceptional cases that a sand and gravel deposit can qualify. Oil, gas and lumber are easily recognized as exhaustible natural resources, but it is only where sand and gravel deposits are shallow and relatively scarce that they can be made to come under the tax relief in Section 735.

When this section was added to the law in 1942 it did not apply to certain lessors who were paid in accordance with the number of mineral units recovered from the property by the person, or corporation, to whom it was leased. The Revenue Act of 1943 cured this situation by specifically providing that the relief granted under Section 735 applied to such lessors. Congress, however, limited the lessor amendment to taxable years beginning after December 31, 1941.

There are other sections of the Revenue Act which provide possible relief. Under Section 721, if a corporation receives income of a kind that it is abnormal to receive, it is entitled to relief. Also, if the taxpayer normally derives income of such class, but the amount of such

income from such class is in excess of 125 percent of the average amount of income of the same class for the four previous taxable years, the taxpayer is entitled to relief. This section is designed to take care of sudden bulges in income for reasons that are not recurrent, and hence have little to do with war business.

Under Section 731, certain rare minerals, including mica, fluor spar, flake graphite, and vermiculite, are especially exempt from excess profits tax based on exhaustion of such deposits. Practically all the other rock products producers can get relief only in exceptional instances, where it can be proved that application of the law is manifestly unfair, under Section 735.

Discussion of Tax Problems

V. P. AHEARN, executive secretary, National Sand and Gravel Association, extended the discussion of tax problems by repeating the advice he has given his members on previous occasions, that they make shipments of materials for government projects on bills of lading to the government (state or national) in care of the contractor, wherever this can be arranged. This exempts the shipments from the 3 percent transportation tax.

Mr. Ahearn reviewed again the case of hired trucks, where truck owner drives his own truck, or hires his own drivers. As the case now stands, such contract drivers are considered employees of the producer for the purpose of collecting the social security and unemployment insurance taxes, but as carriers for hire when collecting the transportation tax. In other words, one or the other tax must be paid by some one.

Production Difficulties

DR. MARCELLUS H. STOW, director, Mining Division, War Production Board, was to have given an informal



Eric Ryberg, right, chatting with a friend

talk to the board of directors of the association, but was unable to be present. In lieu of the address, Secretary Ahearn read extracts from a letter sent him by Dr. Stow, in which he urged producers to: (1) Keep abreast of developments in the manpower situation; (2) not to expect to obtain truck tires except in foundry sand and limestone fluxstone operations; (3) that fewer trucks would be available for civilian industries; (4) that tractors, shovels and cranes are getting scarcer all the time, because of increasing military needs.

Price Ceilings

Price ceilings and possible relief from present ceilings were discussed briefly, with emphasis on the point that while there are some really desperate cases, requiring relief, it is entirely a problem of the individual producer, or producers of a special locality, to show proof of the need of relief. It is doubtful if there will be a removal of price ceilings or a general relief from them until after V-E day. There have been cases of relief in the sand and gravel industry. Los Angeles prices were increased as a result of wage increases and a carefully prepared and very complete analysis of the business of some 70 percent of the producers there. Each producer submitted his complete records, but no one was permitted to see his competitor's.

Secretary Ahearn urged the use of the local technical advisors of the Mining Division of W.P.B., in seeking machinery, equipment and supplies. There are now about eight such advisors in various parts of the country. Under the present rulings sand and gravel producers may obtain 120 percent of their first quarter 1943 allotments for the first quarter of 1945, provided, of course, they can justify such requirements. They may also obtain capital items up to \$500 cost under the same ruling.

Manpower Shortages

Secretary Ahearn warned that manpower would soon become the most difficult operating problem facing the industry. There is still much confusion over the application of the new Selective Service rulings. The sand and gravel industry is in a twilight between essential and non-essential industry, depending entirely on the character of the construction project being served. Up to this time Mr. Ahearn said the local draft boards had been very fair. Producers were urged to obtain a "locally designated need." However, it appears inevitable that producers will have to give up all able-bodied men under 30 years old. At present, there is no law requiring any man to leave one job for another held to be more essential to the war effort.

(Continued on page 76)

GOOD TO THE LAST HAUL

Our experience in building conveyor belts for highly specialized types of service covers a wide range of operating problems and enables us to guarantee that BWH belts give exceptional service.

BWH conveyor belting, made by the Rotocure Process of Continuous Vulcanization, is uniformly vulcanized, uniformly stretched, and will be uniform in service. Maximum efficiency and minimum cost in actual use are the first considerations in the manufacture of BWH belting.

BOSTON WOVEN HOSE & RUBBER CO.

WORKS: CAMBRIDGE, MASS., U.S.A. P.O. BOX 1071, BOSTON 3, MASS., U.S.A.



Engineering Problems

(Continued from page 74)

AN OPEN FORUM on engineering problems was conducted by Director of Engineering STANTON WALKER, with emphasis on the production of fines in sand, granular

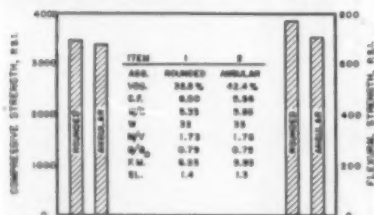


Chart 1: Effect of angularity on strength of concrete

bases, asphalt sand and the Simplified Proctice sizes. Mr. Walker had prepared a technical paper, "The Flexural Strength of Concrete" for presentation, which we review only briefly.

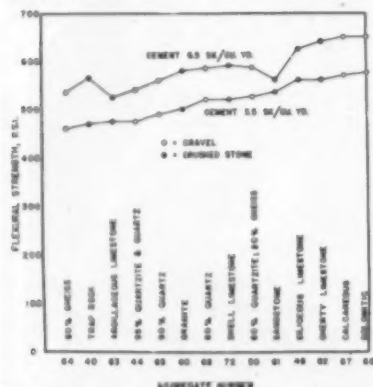


Chart 2: Effect of coarse aggregate on flexural strength

Mr. Walker, in this paper, described the occurrence of stresses and methods of their determination by standard testing procedure. Readers are most concerned with the effects of certain characteristics of aggregates on the flexural and tensile strengths of concrete. Mr. Walker pointed out that the quality of the concrete is important to flexural and tensile strengths and that these properties appear to be more sensitive to certain characteristics of the aggregate, particularly the coarse aggregate, than compressive strength. Also, water-cement ratio, and size and grading of aggregate affect the flexural and tensile strengths in the same direction as they affect compressive strength, although at a lesser rate.

The bulk of Mr. Walker's paper was concerned with properties of coarse aggregates in their influence on desired properties in concrete, supported by technical data and graphs, several of which are reproduced herewith. Angularity of coarse

aggregate, *per se*, has a negligible effect on either the compressive or flexural strengths of concrete, according to Mr. Walker. Data from tests of this property are shown in Chart No. 1.

However, it was emphasized that the characteristic of the surface of the coarse aggregate which affects the bond with the mortar is of considerable importance to the flexural strength of concrete and of little importance to compressive strength. It was suggested that possibly some physico-chemical phenomena which appear to affect adhesion of bitumens to aggregate are involved in bond with cement. Data from comparisons of 14 aggregates are shown in Chart No. 2 to illustrate the effect of character of coarse aggregate on flexural strength of concrete.

Chart No. 3 illustrates the effects of percentage of wear for various aggregates on flexural strength.

In his conclusions, Mr. Walker stated that the flexural strength of concrete appears to be a more significant measure of the deterioration of concrete than compressive strength. The National Sand and Gravel Association Research Foundation expects to extend its studies on effect of aggregate characteristics on flexural strength in relation to other properties of concrete.

Two Sizes of Sand?

One of the most interesting discussions resulted from a suggestion by Stanton Walker that possibly the sand and gravel industry should give consideration to the production of two sizes of sand, for blending, in the production of sands which must

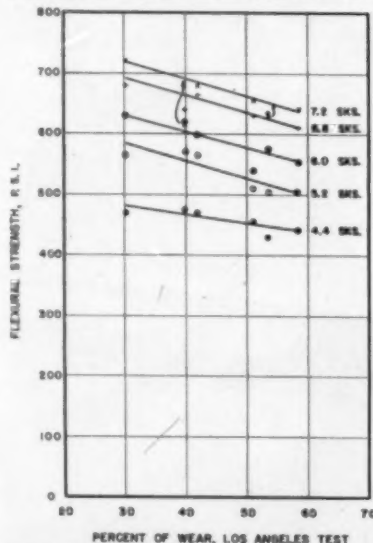


Chart 3: Relation between flexural strength and Los Angeles test

contain relatively high percentages of minus 50-mesh and 100-mesh fines.

He pointed to the trends toward more fines and mentioned that it is not uncommon for specifications to require a range of 2 to 10 percent minus 100-mesh fines. If 100-mesh fines are required, Mr. Walker emphasized that a range of 2 to 10 percent is too wide. In review, he mentioned that the use of low cement factor concretes, as low as 3 to 3.5 sacks of cement per cubic yard, for massive concrete started the trend toward requiring more fines. He said 10 percent minus 100-mesh fines in sand is entirely too much for a 6-sack concrete, in commenting on the different proportions for concretes for various purposes. Of course, different sands cannot be produced to fit the various cement factors desired for differing types of construction.

It was suggested that possibly the use of two sizes of sand be promoted. One would be a normal coarsely graded concrete sand for use in rich mixes; the other would be a "blending" sand which the contractor can add as a separate ingredient at the mixing plant. In some cases, it would be necessary to locate fine sand deposits or purchase such sand from other sources.

F. D. COPPOCK, American Aggregates Corp., told of his experience a few years ago in producing sand for T.V.A. dam construction. On that project a split was made at 30-mesh and the finer sand was recombined with the coarser product for concrete with a cement factor of 3.85 sacks of cement to a cubic yard of concrete.

In speaking of the American Aggregates Corp. commercial plants he said that considerable fine sand, up to 10 to 15 percent minus 100-mesh, is being produced. By knowing the deficiencies of fines in the concrete sand, he said it was not difficult or expensive to recombine the sands. Mr. Coppock believes that all deposits have more 100-mesh fines in them than the producers are recovering. In some cases, it may be necessary to crush pea gravel for the purpose, he said.

R. N. COOLIDGE, Cumberland Sand Co., Nashville, Tenn., told of the use of crushing rolls to manufacture fines from pea gravel. The river deposit under excavation contains less than one percent minus 100-mesh and he said it was cheaper to crush pea gravel than to discard excesses of gravel to recover more sand.

W. H. KLEIN, Dixie Sand and Gravel Corp., Chattanooga, Tenn., believed the suggested possible plan of having two separate grades of sand for concrete would be impractical unless the sand be produced at

(Continued on page 80)



PAPER BAGS that save BOX CARS



PACKAGING in Multiwall Bags offers a space-saving advantage that adds up to box-car proportions.

For example, one ton of a chemical, when packed in Multiwall Bags, will only occupy the approximate space of 1600 lbs. in barrels*. Or, stated another way, Multiwalls permit a saving of up to 20 per cent storage or shipping space over certain types of metal or wooden containers. Figure that saving in terms of freight cars or cargo vessels and you have one important reason why many manufacturers are turning to Multiwalls as the solution to more and more of their packaging problems.

SAVE LABOR, TOO

Multiwall Paper Bags are easier to load and unload...they save costly

handling time. They will be designed to withstand specific climatic and transportation conditions in all parts of the world.

These bags are moisture resistant, too—a necessary protection for many products. And because they are siftproof, they eliminate sifting losses in transit, as well as messy storage problems.

Multiwall Paper Bags will be especially made to save time and money for your business. Write for full information today.



See how neatly and compactly Multiwall Paper Bags fit in a freight car. This kind of packing protects products and saves time as well as space.



MULTIPLY PROTECTION • MULTIPLY SALEABILITY
ST. REGIS PAPER COMPANY
TASCANT CORPORATION

NEW YORK 17: 230 Park Ave.

CHICAGO 1: 230 No. Michigan Ave.

BALTIMORE 2: 2601 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St.

IN CANADA:

St. Regis Paper Co. (Can.) Ltd.
Montreal, Quebec
Vancouver, British Columbia

Boston, Mass. Birmingham, Ala. Dallas, Tex. Denver, Colo.
No. Kansas City, Mo. Los Angeles, Calif. New Orleans, La.
Franklin, Va. Seattle, Wash. Nazareth, Pa. Toledo, Ohio

* Report on bulk packaging prepared by Chemical and Metallurgical Engineering.

Construction After X-Day

Analyze construction potential which will follow the defeat of Germany

THOS. S. HOLDEN, president of F. W. Dodge Corporation, was another speaker on the program of the cancelled conventions who addressed the Directors' Meeting of the National Sand and Gravel Association.

Mr. Holden saw little reason to worry about the status of postwar construction planning. Already the volume of planned projects, private and public, considerably exceeds any amount likely to get into actual construction in the first 12 months after X-Day. He explained that X-Day would be the day when our general staff decides that the war, insofar as Nazi Germany is concerned, is so completely won that it can issue wholesale cancellations of war orders and permit a sizeable amount of industrial reconversion to start.

Up to November 30, 1944, his company's field staff had reported for its 37 states territory, 65,565 projects contemplated for the postwar period, at a total estimated cost of \$12,375,490,000. Of these projects, 23,811 were reported as being in the design stage, their total estimated cost being \$5,946,765,000. He said that the dollar volume of planned postwar projects exceeds the total contract volume for the year 1938 by 86 percent, the contract volume of the year 1939 by 68 percent, and the contract volume of 1940 by 48 percent. Mr. Holden expressed the opinion that the actual volume of new construction that can actually get started in the first 12 months after X-Day will likely approximate the volume of the year 1938 or about \$3,197,928,000.

Mr. Holden presented a detailed analysis of postwar planned work and actual 1938 contracts, the comparative figures following:

	Planned for Postwar	1938 Actual
PRIVATE		
Non-residential	\$ 998,273,000	\$ 499,819,000
Residential	645,503,000	899,561,000
Heavy Construction	171,686,000	92,828,000
Total Private	\$1,815,462,000	\$1,492,208,000
PUBLIC		
Non-residential	\$ 881,793,000	\$ 572,318,000
Residential	172,366,000	86,226,000
Heavy Construction	3,077,144,000	1,046,176,000
Total Public	\$4,131,303,000	\$1,705,720,000
GRAND TOTALS	\$5,946,765,000	\$3,197,928,000

Although these comparative figures show that the volume of planned work is out of line with the pattern of the year 1938, residential work being much too small and public heavy construction too large for a balanced program, there is no cause for concern. He explained it as a statistical deficiency as most single-family house projects are normally

started with only a brief period of advance planning. The residential figures are therefore merely a sampling of the potential market. Large savings, vast funds of mortgage money seeking outlets, and the special encouragement to home acquisition given to veterans under the G.I. Bill of Rights are likely, he said, to add up to a combined demand greater than the industry can supply.

On the other hand, he said that the picture on planned public work is quite different. With planned public projects in all classifications totaling \$4,131,303,000, which is an amount greater than the total dollar volume of all private and public contracts in any of the years 1938, 1939 or 1940, the tendency would be to crowd out every potential private project on the list if this work was put under contract immediately. Mr. Holden expressed the view that artificial stimulation of public works in the early postwar period can scarcely fail to intensify undue competition with private projects for needed manpower and materials. This situation will be accentuated as the list of planned projects has been growing since November 30 at the rate of some \$21,000,000 per business day and will continue to grow right up to X-Day. These figures do not take into account deferred maintenance, repair or minor modernization jobs. He said that it will be a matter of several years before the country can get caught up. After the World War I, he pointed out, it took six years, but then the revival period was stretched out by reason of a two-year price-deflation depression in 1920 and 1921; this made a net recovery period of four years. Five

years of general business expansion and record-breaking construction activity followed.

Three Phases of Revival

Mr. Holden said that after restrictions are removed or lightened, construction revival will progress through three phases, gradually at first, and then with accelerated velocity. The



Thos. S. Holden

first, or reconversion phase, he said, will last three to six months from X-Day. There will be considerable deferred maintenance, repair, and modernization work done in this period. There will also be some construction in reconverting war plants. An early start will be made on house building, particularly in the middle rather than low price ranges. Heavy engineering construction, using principally non-critical material and unskilled labor, would make an early start, but there would possibly be a shortage of transportation facilities.

The second phase would consist principally in a snowballing of contracts for new construction that have begun to appear in the first phase. Store modernization and new factory building for non-war industries would get underway. This phase will extend well beyond the termination of V-J Day or the termination of hostilities with Japan or a year after X-Day.

The third phase will begin after rent controls are lifted practically everywhere and after construction costs have become relatively stabilized, giving assurance to investors that rental projects can safely proceed. In this phase, apartment building will increase greatly. If by that time office space released by demobilization of government war agencies has been absorbed, new office buildings may begin to appear in contract listings. Larger store and factory buildings will come along, and larger numbers and varieties of public building projects will be started. In the third phase there may develop a shortage of skilled building craftsmen and strikes for wage increases.

Mr. Holden listed four reasons for anticipating a slow revival in the early phases of recovery. These bottlenecks are: 1. Government controls; 2. Material supply problems; 3. Price problems; 4. Manpower problems.

**FOUNDED
IN 1906**

BUT, we have young ideas about designing Crushing Plants..

When you buy crushing equipment—or any other kind of equipment, for that matter—the more it weighs, the more metal and labor have gone into it, the more it costs. We have long fostered the idea of cutting down weight and we have succeeded in doing so without reducing capacity or impairing efficiency. Compare modern Universal plants with heavier, bulkier plants and you will find that Universals will give you as much or greater output with even lower maintenance costs. Eliminating this excess baggage has made Universal plants easier on roads and easier to move.

Looking back over the past 39 years you'll find Universal engineers have never been idea-shy. Starting with the overhead eccentric jaw crusher, they have given the industry many developments which have become standard. In the coming postwar period, look to Universal for new developments—continued leadership.

UNIVERSAL ENGINEERING CORP.

617 C Ave. West,

Cedar Rapids, Iowa

No. 800 secondary crushing and screening unit steps-up output of a number of types of primary plants.

UNIVERSAL



ROCK AND GRAVEL CRUSHERS, CONCRETE
AND BRICK HAMMERS, COMPLETE
WASHING AND SCREENING PLANTS,
WASHING PLANTS, ASPHALT PLANTS,
SPREADERS.



Complete, compact "800" primary and secondary crushing plant. At left: Two part portable quarry plant; primary jaw crusher, and secondary crushing roll and screen.



This "22-Q" two-unit quarry plant averages 22,000 yds. monthly. Maintenance costs are low.



This practical gravel washing and sizing plant assures lowest cost per yard of material.



(Continued from page 76)

the plant. Mr. Klein had no sympathy for mixes with cement factors as low as four sacks and said the industry should think in terms of six-sack concrete. Mr. Walker mentioned that there is a trend toward lower cement factor concretes for highway roads.

In reply to a question, Mr. Coppock told of separating sand sizes at 3/16-in., 1/4-in., and 1/10-in. for recombination. He said that production can be maintained continuously with recombination of sand sizes on reclaiming belt conveyors.

Mr. Walker said that if one all-purpose concrete sand is produced, it will be too coarse for some purposes and too fine for others. He mentioned that the Utah Sand and Gravel Products Co., Salt Lake City, Utah, has shipped in sand from other deposits for blending with normal run sand. Blending, he said, would help in producing a more uniform product.

Mr. Coppock suggested a device in use by his company for maximum recovery of fines. He told of the use of an added large tank with a wide outlet and a wide inlet with a good spread to receive the wash water and fines. Sand settled in the tank was then pumped to a Dorr classifier where there was no current to hinder settling.

In conclusion, Mr. Walker mentioned the review of aggregate size specifications now under way in several sections of the country, notably California. He said that a number of forces are working on the problem to simplify aggregate specifications and suggested that the recommended Simplified Practice sizes be studied.

Wages and Business Conditions

The concluding session of the National Sand and Gravel Association Board of Directors meeting was devoted to discussion of wages and hours of employment and business conditions in the industry.

Executive Secretary V. P. Ahearn, in commenting on the obligations of industry in the re-employment of war veterans, read some of the pertinent facts from a paper "Readjusting the Veteran to Civilian Life" by Lt. Col. Emmett G. Solomon, chief of the Veterans Personnel Division, Selective Service System. The paper was prepared previous to cancellation of the convention and is abstracted in this issue.

Mr. Ahearn called attention to recent signs that efforts will be made by field representatives of the Wage and Hour Division to rule that the sand and gravel and ready-mixed concrete industries come under provisions of the law when the materials are used in the repair or construction of transportation facilities of interstate commerce. This is in disagreement with a ruling handed

down by the Division in 1939, to the effect that materials so used are not under the law unless they move physically across state lines.

Producers from various sections of the country were asked to comment briefly on business conditions for the industry in their respective territories.

H. F. G. PELSUE, New York, N. Y., reported that 1945 volume of business would be less than in 1944.

STEPHEN STEPANIAN, Columbus, Ohio, said that prospects for 1945 were not optimistic for the present and that the majority of the sand and gravel tonnage was ballast.

ALEX. FOSTER, JR., Philadelphia, Penn., reported that 1944 volume of business in the area from Trenton, N. J., to Wilmington, Del., 20 miles on either side of the Delaware river, was slightly more than 50 percent of the 1943 volume. He estimated that 1945 will be a lean year with a volume of sales 60 to 70 percent that of 1944 and predicted that there will be no real boom until the war is over.

A. R. SHIELY, St. Paul, Minn., said that prospects for business depend upon the war. He mentioned that a year ago he predicted a 1944 volume 50 percent in excess of 1943 and that sales actually were 110 percent over 1943 figures. His company has more business on hand than it had a year ago but the volume of sales will depend upon the manpower situation. If sufficient manpower is available, 1945 volume will exceed 1944.

J. S. COOPER, Memphis, Tenn., reported enough orders on hand now to operate for six months. His production is mainly of Camden chert with a clay binder.

T. E. POPPLEWELL, Fort Worth, Texas, said that a year ago the outlook for 1944 looked poor in comparison with 1943 but that volume in the last half of 1944 was very good. Orders on hand are sufficient for six months' operation in all sections of Texas.

PAUL BIRD, Boston, Mass., reported that conditions in New England parallel those reported for the Philadelphia area. Volume in 1944 was approximately 50 percent that in 1943 and he predicted that 1945 volume will not exceed 70 percent the tonnage in 1944.

ERIC RYBERG, Salt Lake City, Utah, reported a tremendous expansion program with the railroads and predicted that if the railroads have sufficient manpower there will be the largest volume of railroad ballast in history.

ROBERT MITCHELL, Los Angeles, Calif., reported that 1944 volume equalled that for 1943. In anticipation of a prolonged war in the Pacific, he predicted that additional war construction projects will be required and that producers will be busy in 1945.

(Continued on page 102)

A

Boost for the Cement Industry

The thousand and one ways in which cement has contributed to our modern high standard of living are often taken for granted and given little public recognition. To help the cement industry tell its story, Bemis Bro. Bag Co. placed the full page advertisement "I Told Him You Didn't Order Any Cement" before the 1,800,000 readers of Time, Business Week and Newsweek.

You can help tell the cement industry's story to even greater audiences by displaying poster-size, 2-color enlargements (17 x 22 inches) of this advertisement. We will send you as many copies as you can use. All advertising will be deleted, of course. Send the coupon below today.

BEMIS BRO. BAG CO.
408-M Pine Street
St. Louis 2, Missouri

We will use _____ copies of poster
"I Told Him You Didn't Order any
Cement." Please send to—

Name _____

Address _____

City & State _____

"I told him you didn't order any CEMENT

...BUT HE INSISTS THESE FOUR BAGS ARE FOR YOU"

Whoever you are—businessman, lawyer, housewife, druggist, student, it makes no difference—did you know that four bags of cement are made for you every year?

You may not buy it... or even see it... as cement. But the American portland cement industry, in normal times, annually produces approximately four bags for every man, woman and child in the United States. And you certainly use your share, and more. There's scarcely

a minute that you aren't enjoying the advantages of this versatile, long-lasting, firesafe plastic.

Think it over. The buildings you live, work, play and worship in... cement used a score of ways. The farms your food comes from... barns, milk house, silos, tanks—a hundred uses. Your water supply... filtration beds, reservoirs, pipe, pumping stations. The factories, mill and stores that supply you... more cement. Nearly everything you use travels over concrete roads, on railroads that use concrete scores of ways, or by planes that land on concrete runways. And you yourself walk and ride on concrete every day.

Yes, waking or sleeping, you're making good use of your four bags of cement. It's as ever-present as the air you breathe... and you're almost as dependent on it.



The Cement Industry, using hundreds of millions of paper and cotton bags a year, is one of the many Bemis has served for scores of years.

Bemis makes cotton, burlap and paper ship-

ping bags for almost limitless types and sizes for literally hundreds of different uses... and new uses are developing constantly. Almost everything you eat, wear or use may make at least part of its trip to you in a Bemis Bag.

BUY AN EXTRA WAR BOND TODAY... AND KEEP IT!

BEMIS BRO. BAG CO.

GENERAL OFFICES: ST. LOUIS



Burlap, Cotton and Paper Bags

23 PLANTS THROUGHOUT THE COUNTRY

Phosphate Products

Phosphate Production Problems

Article 4: Drying and Grinding. General Arrangement

By OTTO H. WUSTRACK

AVERAGE moisture content of the discharge from the washer is in the neighborhood of 32 percent. Fully 10 percent is free surface moisture readily evaporated and therefore stockpiling in yards for several weeks, or even months, is regularly practiced, preparatory to drying, the necessary extra handling paying very well for itself by virtue of the increased dryer output as well as the greater facility afforded in maintaining an even flow of rock throughout the drying procedure. The upper limit of trouble-free flow through the dryer shell is about at a moisture content of 25 percent. Above this sticking on feed chutes and building up on flights becomes a nuisance if not a serious production deterrent.

Standard wet rock handling equipment at several plants is the stiff-leg derrick equipped with a 1½-yd. clam-shell bucket. Steam driven engines formerly used have been replaced by electric motors. The working radius of the boom is from 70 to 80 ft. and the length of arc limited to about 270 degrees putting a definite limit of the quantity of rock which can be stockpiled within reach. With only a stiff-leg in use a plant having a nominal washing production of 3000 tons per week would only have the capacity to air-dry rock for two weeks before it would have to be put through the dryer in order to make room for succeeding washer production. To allow more time and especially to provide against reduced washer output during the dry season, provision is usually made for stockpiling 50,000 tons or more. To this end auxiliary equipment such as a locomotive crane with clamshell bucket, or a slackline with modified scraper bucket, are used.

The air-dried rock is fed to an 80-ton cone bottom steel tank feeding an inclined rubber belt conveyor. A uniform feed to the belt and hence to the dryers is partially achieved with the aid of a vibrator such as the Syntron, which operates only when an arm, indicating a thickness of feed shallower than a previously determined depth, and connected to a mercury limit switch, closes the circuit. Since the feed rock varies in water content from 18 percent to 25 percent the discharge is not always uniform, especially if a batch comes through which is high in alumina as well as in moisture. The delivery is then alternately light and heavy with vibrators and may, under

the worst conditions, bridge across the throat of the cone, in which circumstance vibrating only aggravates the stoppage by packing the rock in the tank above the opening.

The feed belt discharges into the hot end of 7-ft. diameter by 40-ft. long non-insulated rotary dryers, direct-heated from coal-fired combustion chambers, or kilns. The discharge end of the dryer shell is usually equipped with a ¾-mesh trommel screen, the oversize going to the gyratory crusher via bucket elevator while the undersize discharges into a 4-cu. yd. skip car which in turn delivers to dried storage by gravity. The car runs on an inclined track to attain an elevation 30 ft. above the floor of the shed. A high starting torque, 40-hp. motor operates the drum hoist which pulls the car to any point in the storage shed, the bottom dump gate being mechanically opened by a catch set at the required point in the track. A counterweight brings the car back and obviates the use of two drums.

The storage shed is an open side,

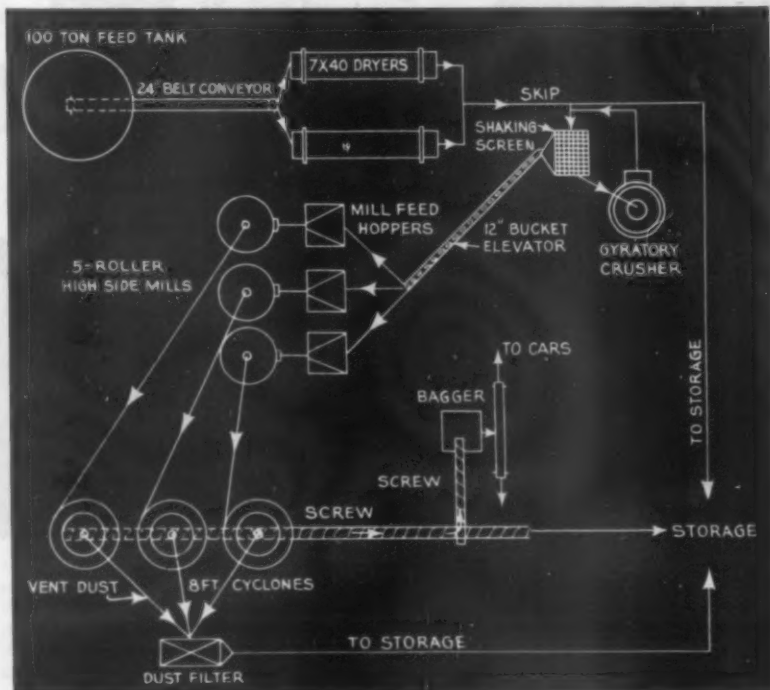
steel framed building except for the section in which ground rock is stored, which is entirely enclosed. A belt conveyor in a tunnel under the concrete floor receives dried rock from the shed by gravity discharge through gate equipped openings in the floor. Thus three-quarters of the storage capacity is handled by gravity both for filling and emptying.

The belt runs under an electromagnet to extract any tramp iron before discharging onto a shaking screen which sends the oversize to a gyratory crusher while the undersize discharges to a bucket elevator supplying feed hoppers above the grinding mills.

These grinding units are Raymond five-roller, high side mills in closed circuit with an air separation system, the fines being collected by 8-ft. cyclones. These deliver either directly into storage for future bagging or bulk carload shipment, or into a hopper feeding a Bates bagger, via screw conveyor.

Dryer Operation

The rotating shells have a slope toward the discharge end of ¼ in. to ⅜ in. per foot, and revolve at a rate



Typical flow sheet of phosphate drying and grinding operations

When you look to the future

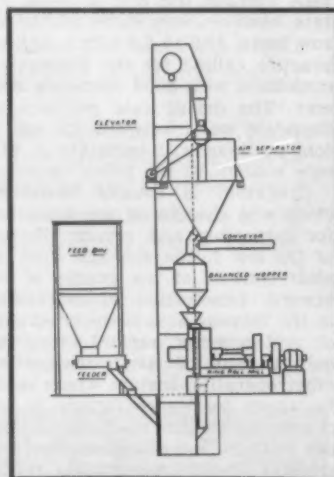
*...bear in mind
past performances...*



THE service record of STURTEVANT Air Separators in rock products plants is unequalled. In the Cement Industry alone hundreds have been installed, all "On Approval." And there hasn't been a single rejection! No air separator has equalled the STURTEVANT in mechanical efficiency—in making grinding reach the point of maximum efficiency. When you put STURTEVANT Air Separators into your plans of operation you get (1) Range of fineness from 40 to 350 mesh, (2) Capacities of $\frac{1}{4}$ ton to 50 ton, while increasing mill capacity as much as 300%, (3) Controlled specific surface area, (4) Lowered mill and product temperatures, and (5) The only separator quickly adjustable to meet all requirements and specifications under all conditions.

Closed Circuit Grinding System

The Sturtevant Integral Closed Circuit System diagrammed here makes an ideal arrangement for agricultural limestone, lime and hydrate and related products. It gives maximum tonnages of sizes in demand today. Write today for our bulletin describing this and other grinding and separating arrangements.



STURTEVANT MILL CO.
HARRISON SQUARE • BOSTON 22, MASS.

AIR SEPARATORS • RING-ROLL MILLS • JAW CRUSHERS • CRUSHING ROLLS
SWING-SLEDGE MILLS • MOTO-VIBRO SCREENS • ROTARY FINE CRUSHERS

of three to four r.p.m. which is accepted as good practice. The design is of the standard trunnion with thrust wheel, the power being transmitted from a 15-hp. motor through silent chain and gear drive to a girth gear fastened to the shell. Curved lifter flights at the feed end quickly transfer the wet rock to the interior of shell where horizontal flights pick it up as it moves along laterally. Thus the rock is constantly poured through the gases of combustion as it moves slowly toward discharge, the retention period being, roughly, 18 minutes for a 40-ft. long shell.

The combustion chamber or kiln for a 7-ft. shell is 8 ft. wide by 8 ft. high and 10 ft. long inside with 18-in. refractory brick lining, air cooled. The design sometimes includes a corbel which decreases fuel bed area but adds to the wall thickness in the burning zone. Detroit Rotostokers, or other makes of stokers, are used to feed $\frac{3}{8}$ -in. to $\frac{1}{2}$ -in. low grade bituminous slack. The ratio of coal burned to rock dried is approximately 1 to 18 under optimum conditions. The grate is stationary, slag removal and fuel bed work being effected through the fire door. Air is supplied under fuel bed and through the side walls, a 36-in. Claridge fan supplying sufficient air to a pair of kilns. Temperatures are from 2000 deg. F. to 2200 deg. F. in the combustion chamber, but in the shell are no more than 700 deg. F. to 800 deg. F. with stack temperatures at 300 deg. F. to 400 deg. F. for optimum conditions. When the rock feed temporarily drops off a manual adjustment is made on the stoker to prevent burning the end of shell. Fuel rate, however, only varies within narrow limits (0.6 to 0.8 t./hr.), the best practice calling for the highest rate consistent with good operating economy. The drying rate per unit will therefore vary between 12 and 18 tons per hour with variation in moisture content as the prime cause.

Operation is usually round-the-clock and shutdowns are made only for inspection and repairs. Because of the low fusion ash and high sulphur content of the grades of coal burned, penetration of refractories in the burning area is the chief cause of replacements, repairs every four months being not at all unusual. Another operating feature which makes for tough service conditions, is that of opening the fire door several times per shift for reasons mentioned previously. Therefore the ideal refractory must have the following qualifications:

1. Good density to resist slag penetration
2. Resistance to spalling
3. High softening temperature
4. High abrasion resistance
5. Low thermal conductivity

Ordinary fire brick will deteriorate rapidly in the burning zone and wear back at an alarming rate. Super duty brick is generally satisfactory in all respects except for spalling. The best types of refractory for the conditions are quite probably kaolin and fused alumina, but first cost is high, often double and treble that of high duty fire clay. Nevertheless, a proper selection can more than make up for high first cost by savings realized from increased operating hours and decreased repair labor.

Other items which require special attention because of the severity of the service, are the wet rock feed chutes and the lifter flights. The chutes are subject to the outside air at one end and to the impingement of the products of combustion at the other. Grain growth and hence rapid disintegration is the history of ordinary metals used; on the other hand a modified Ni-Resist cast iron outlasts ordinary installations several times over. Similar success has also been enjoyed in the use of Ni-Resist for the lifter flights.

A certain percentage of lump is desirable to prevent sand from sticking and baking to the shell. When preparing rock for fine grinding, moisture content of the mill feed should be 2.0 percent or under. In a 40-ft. shell with $\frac{3}{8}$ -in. slope the retention period is around 18 minutes, which is sufficient to bring the moisture in the sand to that figure, but is much too short for the lump which dries largely by diffusion. To cut capacity for the sake of the lump is of course impractical so advantage is taken of the heat in the sand, the diffusion operating by storing lump and sand together for from 24 hours to 48 hours after discharge from dryers. In this way, the lump, which retains 4.0 percent to 5.0 percent water at dryer exit, can be dried to have less than 3.0 percent. Needless to say the sand also loses additional moisture in storage, but the benefit is very slight at a water content of 1.5 percent, which is readily understood if it is remembered that rate of diffusion depends on the difference in moisture concentration between the surface and the interior of the grain.

Operating a drying plant is simple compared to that of running a washer. A criterion of dryer performance is the temperature of the gases leaving the stack and their variation from the norm, indicated by a recording thermometer which simplifies the operators' thinking. All units are separately motor driven, such as stoker, dryer shell, elevator, and skip car, the energy requirements not exceeding 1.25 kw. per ton of rock dried. Thus cost of drying seldom exceeds 75 percent that of washing.

The Raymond five-roller high side mill is excellent for fine grinding of dried phosphate rock. Under good

conditions a mill may grind up to a rate of 4.0 tons per hour of high grade rock to a fineness of 85 percent through 300-mesh. Improvements in mechanical design permitting greater peripheral speed of the rollers on the bull ring would increase capacity greatly, but at present the greatly magnified vibration, above a certain speed, limits this. At a central shaft speed of 50 r.p.m. damage caused by vibration can be considerable when the cushioning effect of a full load between rolls and bull ring is nullified by temporary stoppage of feed.

Grinding Mill Operation

The latest designs include a whizzer separator and silica throwout. The former effects a closer size separation, reducing over-grinding and therefore increasing the capacity from 5 to 10 percent. The throwout discharges flint grains centrifugally to the periphery of the housing to be eliminated through a chute to the outside. Thus, instead of falling back again and again into the grinding zone until reduced sufficiently to be carried to the cyclone they are expelled as large grains. Grinding capacity is thus noticeably increased. Furthermore, roll wear is reduced, and accumulations in the air ports cut down to a minimum. When grinding low grade, the flinty elimination is sufficient to show a measureable increase in the grade of the ground product.

The necessity for grinding lower grades, with their accompanying higher silica concentrations has made roll wear a serious problem. In the days of 75 percent B.P.L. rock, ordinary chilled cast iron gave satisfactory service, but today the action of the harder constituents in the feed soon wears through to the soft interior. The use of chilled NiHard cast iron for this service is finding favor, for at less than double the cost, it very often has three and four times the life of that of white iron.

Three main factors operate to vary the capacity of a mill, viz:

1. Grade of feed
2. Moisture in feed
3. Fineness of product

A few years ago when mill feed averaged better than 75 percent B.P.L., it was not unusual to produce better than 4.0 tons per hour of 85 percent through 300-mesh at somewhat slower speed than that used at present, and without benefit of the whizzer. Grinding without it meant that about half the time the fineness actually approached 90 percent through 300-mesh. On the other hand a 70 percent B.P.L. grade, even with benefit of closer size separation, will seldom grind faster than at a rate of 3.5 tons per hour.

(Continued on page 99)

PIONEER produces the aggregate for TEXAS' LONGEST ASPHALT JOB!



THERE SHE STANDS, the Pioneer plant that is producing 50 cubic yards of material per hour, passing a $\frac{1}{2}$ " round, for the longest continuous asphalt job ever undertaken in the State of Texas—43 miles. A Pioneer travelling grizzly feeder receives the quarry material and regulates its flow to the crushing set-up. The first crushing unit is a Pioneer 20x36 anti-friction jaw crusher mounted on trucks. Crushed material is carried from the jaw crusher by a 30"x70' Pioneer Belt Conveyor to a 4x10 Pioneer triple deck vibrating screen, mounted over a Pioneer steel bin.

The oversize is conveyed to two Pioneer roll crushers, one equipped with corrugated manganese

shells, the other with smooth manganese shells. Crushed material feeds back to the main conveyor thus closing the cycle. The project is typically Texan in size—widening a 20 foot surface to 22 feet and placing a hot mix asphalt concrete leveling and surface course for an average of one inch in thickness over the entire width and for a length of 43 miles. Over 30,000 tons of hot mix asphalt concrete are required.

And required of the aggregate producing plant is continuous, dependable, low-cost production to meet all operating schedules and to make every job show a profit. Pioneer was the choice of the contractor, The Texas Bitulitic Company, Dallas.

Pioneer Booklets



Pioneer Booklets, graphically illustrated, simply detailed, contain money making information for the man getting ready for tomorrow's job. Write for them today.

Pioneer equipment is profit making equipment. It is durable and built to function with a minimum of maintenance. Planning with Pioneer involves no obligation. Regard its complete service as an ally of your business which is always available.

Pioneer

ENGINEERING WORKS

Jaw Crushers - Roll Crushers - Screens - Conveyors - Feeders - Washers

MINNEAPOLIS 13, MINN

Labor

EFFICIENCY

Through Job Evaluation

Actual measurements to determine standards for specific quarry operations govern wage incentive plan

AN ANALYSIS of a stone quarry made recently revealed that labor costs per ton of rock quarried had increased 91 percent since 1939, and production per man-hour had decreased 30 percent. It was also found that an average of 13.4 tons of stone was handled per man-hour in 1939, but only 9.84 tons in 1943. These figures indicate the seriousness of the problems of production and labor costs now facing many plants in the industry.

The production problem is not confined to inadequacy of machines and methods. The important element is lack of labor efficiency. It is apparent that any solution of the labor problem must recognize the need for making every worker feel that in the matter of wages he is not being discriminated against. Where workers' base wages are the result of snap judgments or a blind following of precedent, a common finding is that many workers are likely to be underpaid, many overpaid, and many paid inconsistently with comparative labor inside or outside the plant.

Employees quickly become aware of such inequities and show their resentment through absenteeism, waste, inefficiency and excessive labor turnover. Jealousies and suspicions develop.

Evaluating the Job

Before one can price a job fairly in relation to prices on other jobs in the same plant, one must analyze each job, using various factors that will allow all jobs to be rated with respect to one another and priced accordingly. This is known as job evaluation.

Job evaluation has been applied for many years by manufacturing plants as a means of improving employee morale and it is fully as applicable to quarries.

The advantages of a modern job evaluation system are many:

1. It determines basic qualifications for hiring and promoting workers.
2. It keeps current a system for upgrading employees.
3. It ascertains if all workers are placed to the best advantage.
4. It justifies the hourly rates in use.
5. It eliminates suspicions, jealousies and discontent about unfairness of wages.

6. It provides defense for management against pressure groups (inside and outside the plant) claiming unfairness of rates.

7. It provides a sound medium for settling labor issues with management.

8. It helps to locate any loopholes through which waste and loss might occur.

9. It establishes basic data for wage incentive systems.

To build a job evaluation system into any industry is neither a complex nor expensive process. There are three essential phases of procedure—(1) ascertaining job characteristics; (2) examining how the work is divided among non-skilled, skilled, semi-skilled and highly-skilled workers; and (3) assembling opinions about the final specifications of the job.

To determine scientifically the qualifications of any job, five factors apply in varying degree to all jobs. They are:

1. Responsibility—This requirement is the trust the employer places in the employee for equipment, tools, material, money or any other company asset.

2. Knowledge and Experience—The satisfactory performance of any task requires a certain degree of knowledge and experience. The greater the degree, the higher the wage that should be paid.

3. Mental Requirements—This factor considers inherent mental qualities that are independent of knowledge and experience and are possessed by some workers to a greater degree than others. The greater the requirements in this direction, the fewer persons there are with the necessary mental ability. It follows that the higher the degree of mental effort required the higher the wage should be.

4. Physical Requirements—This factor is the requirement of strength, physical skill and endurance for the job. The greater this factor, the higher the wage should be.

5. Working Conditions—This factor considers the working environment of a job. The more unpleasant the working conditions, the higher should be the wage.

The important work of job evaluation is in measuring the degree to which each requirement affects the

JOB EVALUATION

• Effective and harmonious utilization of labor is becoming an increasingly important objective of industry. Labor rates likely will continue high into the post-war period and it well may be that profits will materialize only if operations are made efficient. Wage incentives are an extremely live issue today in all industry.

The George S. May Co. has had very recent experience in conducting job analyses and installing wage incentives in the rock products industry. Accordingly, we asked the George S. May Business Foundation, a related non-profit organization, to prepare this special article for us. Certainly, the examples cited in the article will emphasize the value, in terms of dollars and cents, of correcting inefficient operations. — THE EDITOR.

job. This is done by breaking down each of these five factors into smaller units and measuring them. For example, responsibility may be broken down into: safety of others; supervision given; supervision received; material produced; equipment controlled; and tools controlled. The other four factors can be broken down into smaller units in a similar manner.

Then each element in a job is measured, rated and assigned a number of "points." Jobs are evaluated by totaling these points and converting them into money values according to a carefully worked-out scale. In this way a scientifically determined value is placed on every job.

Wage Incentives

While job evaluation, by determining fair basic wage rates, helps to increase worker efficiency, one must recognize that workers are induced to put forth their maximum efforts by being offered added pay for increased effort. This requires setting up a system for measuring the worker's output and relating it to the wage system. Such a plan is known as a wage incentive.

Among the various forms of wage incentive systems, the one known as the standard hour plan is discussed

(Continued on page 88)



How a Bucket Loader Can Save Money *the Year 'Round*

Truck loading time is cut to a minimum by the continuous operation of a Barber-Greene Bucket Loader. But more than that, the B-G Loader has year-round utility . . . can hustle along some construction or maintenance job each season.

★ The B-G Loader yields higher yardage, with less power, less weight, and less cost than any other method.

★ It can effectively handle a variety of loose materials—soil, sand, cinders, gravel or roadway debris.

★ Clean pick-up is assured with the fol-

low-up scraper that cuts to grade and does light excavating.

★ Top performance in stockpile or semi-compacted natural deposit loading, light excavating, shoulder shaping or stripping to grade can be maintained with the 12 selective crowding speeds.

★ By substituting a B-G Snow Loader boom, the B-G Loader can be used for street snow removal.

Ask your B-G representative for details on the versatility and economy of B-G Bucket Loaders. Barber-Greene Company, Aurora, Illinois.

Barber-Greene  *Constant Flow Equipment*



herein and has been found to be well adapted to quarries. This system provides a bonus based on production, to be added to the individual's base rate of pay, as compensation for his production above an established standard. In setting up wage incentives, particular care must be taken in choosing the standard of production on which incentives are to be based.

It is necessary that standards be determined by actual measurements rather than by past performance. Standards that are too high or too low are a handicap to the efficient operation of the incentive plan.

One should not assume that rates based on the latest production figures are acceptable as the standard on which to base incentives. Seldom, if ever, will it be found that standards set up by scientific time measurements will correspond to the actual production figures. The reason is that machine breakdowns, variations in employee morale, and many other similar factors that affect production cannot be considered in setting standards. Thus it is apparent that fixing standards requires a careful analytical study which should be tempered with judgment gained from experience in installing wage incentive systems.

Wage incentive systems are now used in almost 50 percent of all manufacturing establishments in the United States. They have been known to increase production anywhere from 15 percent to 90 percent and even higher, and to reduce unit production costs 8 percent to 30 percent, depending on the product and the type of organization. Some of the quarries that have installed wage incentives report benefits as great as those

realized by manufacturing plants.

In the recent case of one quarry where a job evaluation was made and wage incentives installed, production jumped 20 percent without either increasing unit production costs or adding to investment. Labor unions generally favor wage incentive systems when they are soundly conceived and installed and are fair to the worker. Management finds in wage incentives a stimulus to increased production and lower unit costs.

A stone quarry in the midwest gives its wage incentive plan credit for:

1. Increasing production of crushed stone per man-hour.
2. Increasing earnings of employees in direct ratio to the individual's contribution to increase in production.
3. Increasing company earnings by spreading the burden costs over a greater number of tons of stone produced.
4. Decreasing lost time due to shutdowns for maintenance, repairs, and employee negligence, by rewarding employees for alertness in forestalling possible breakdowns and in speeding up repair operations.
5. Keeping unit labor costs constant.

In another stone quarry, 22 percent of operating time was lost during a recent 29 months' period, due to plant shutdowns and machine inactivity from accidental work stoppages and labor shortages. In still another stone quarry it was found that a 59 percent drop in output per man-hour was caused chiefly by machine idleness. Wage incentives tend to eliminate much of the shutdown time by making it advantageous for

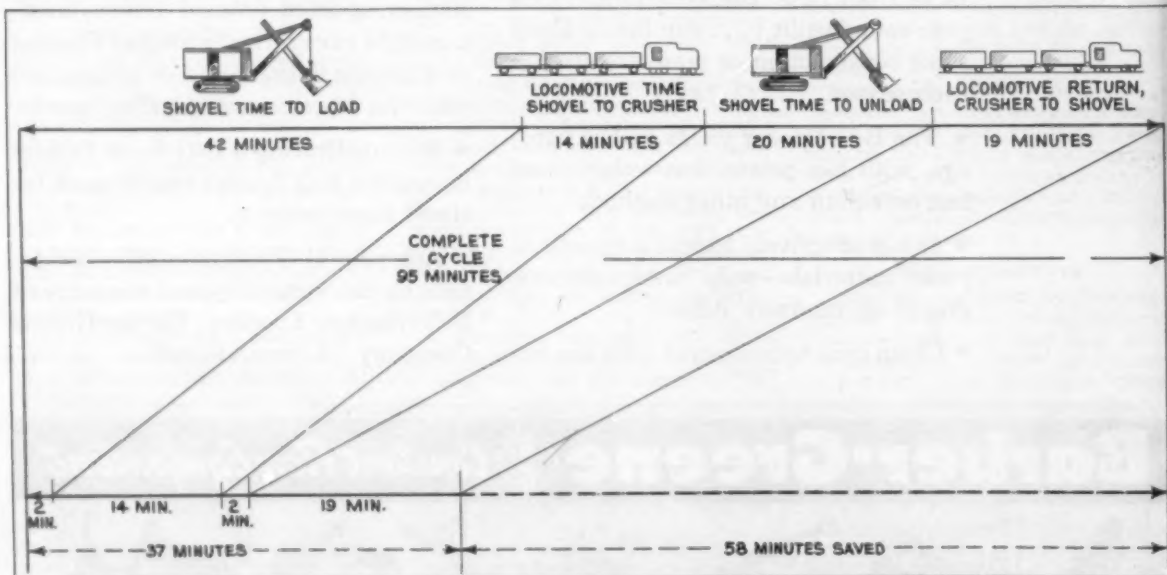
the employees concerned to cooperate with others, to keep plant equipment operating and to maintain a high level of efficiency.

It is particularly important to realize that in the absence of an incentive based on production, there is no inducement for the workers to avoid "soldiering," or to cut down on time wasted. Their interest is mainly in pay-hours. When an incentive is available, based on production credited against accumulated man-hours, the workers soon realize that wasted or lost time piles up their man-hour total while reducing their production total. They will then welcome transfer to other groups when work falls off. Every man will be expected to contribute to the group's production. Members of a group are bound to perform valuable policing jobs on lazy members or time-wasters.

Where accomplishment must be expressed in terms of total output of a crew or a group, incentives have proved as effective as when applied to individuals. Under ideal conditions, group incentives bring out the cooperative spirit found only in team work, which is the real objective of such incentives. Thus they tend to overcome bottlenecks and to maintain an even flow of production.

In one stone quarry, wage incentives were set up to cover all hourly personnel in the quarry, crusher mill and screening plant, as well as those performing loading and storage functions and such miscellaneous work as operating power plants, blacksmithing and repairing trucks. For those tasks in which man-hours of necessity varied directly with quarry tonnage, the unit of production used

(Continued on page 108)

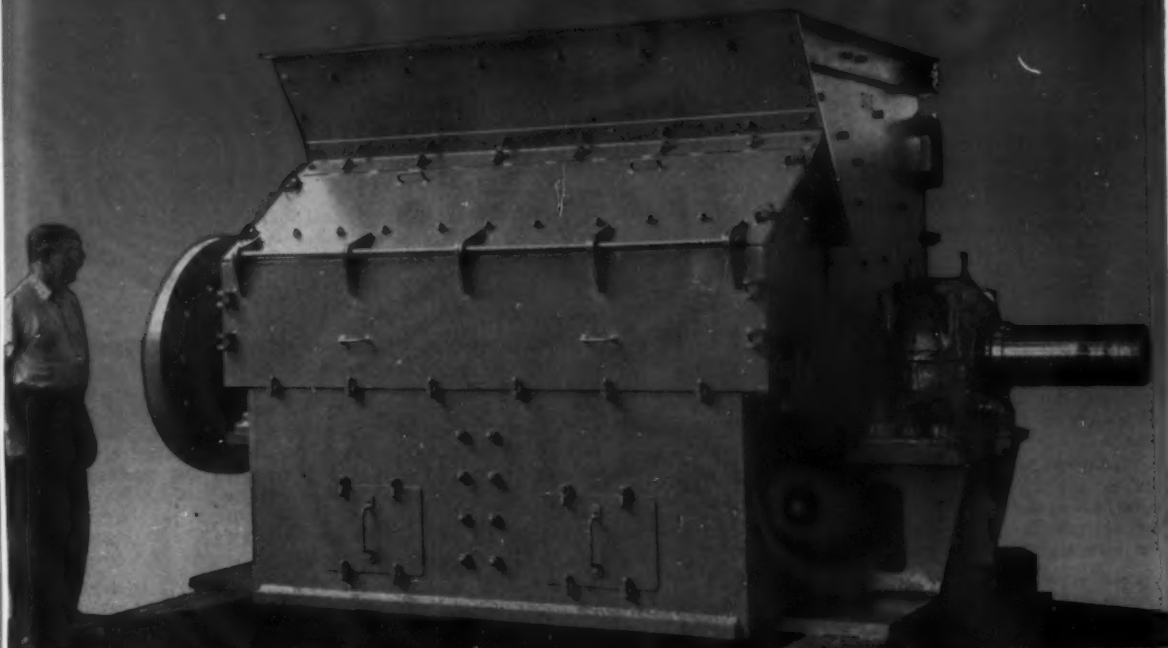


Sixty-one per cent of time saved in complete cycle by reducing shovel time

**THIS
ROCKBUSTER
BREAKS 24" to 30"
CUBES DOWN
TO 1" or UNDER
AT A RATE OF
200 to 300
T. P. H.**

**A PRIMARY AND SECONDARY
CRUSHING UNIT COMBINED**

A single pass through this
giant swing hammer crusher
makes "little ones" out of the
"biggest ones" with record
speed. The final product is
cubical. Investigate.



THE JEFFREY

MANUFACTURING COMPANY

925-99 N. Fourth St., Columbus 16, Ohio

**ESTABLISHED
1877**



Baltimore 1	Chicago 1	Detroit 13	Milwaukee 21	St. Louis 2
Birmingham 2	Cincinnati 2	Harlan	New York 7	Salt Lake City 1
Easton 14	Cleveland 12	Houston 5	Philadelphia 3	Spartan 3
Evans 2	Denver 2	Huntington 19	Pittsburgh 22	

Agstone

High Production in Small Plant

Rocky Ford Limestone Co., Lincoln, Ill., adds new crushing and screening capacity to step up production of agricultural limestone

By H. E. SWANSON



Left to right: E. A. Downing, auditor; John E. Scott, weighmaster; and A. M. Park, owner

ADDITION of new equipment for the purpose of producing more agricultural limestone has enabled the Rocky Ford Limestone Co., Lincoln, Ill., to more than double its production. This plant had a capacity of 300 tons per day which was found to be insufficient to supply the farms in this area. By increasing the production to 700 tons per day, of which 85 percent is agricultural limestone, this company is now meeting demands of farmers in the territory within a radius of 50 miles.

A. M. Park purchased the Rocky Ford Limestone Co. late in 1942 and immediately made the changes necessary to increase its production. Although he is now managing to supply the farmers, he plans to add more equipment this winter in anticipation of a greater demand next year.

The plant is of a portable nature but is set up with permanence in mind since the anticipated demand for agstone is such that this plant can produce to capacity at this loca-

tion for some time to come. The area quarried is 300 acres in extent.

The limestone has an analysis of 93 percent calcium carbonate equivalent. It is quarried from a 9- to 14-ft. ledge covered with 7 ft. of overburden. This overburden is stripped by a D8 Caterpillar tractor equipped with a Le Tourneau bulldozer. Two Sullivan wagon drills, used to drill holes for blasting, are powered by a D-1300, 132-hp. Caterpillar Diesel engine. About 150 1-in. holes are drilled the depth of the ledge. They are spaced 4 ft. apart with a 5 ft. burden. Each blast yields about 2000 tons of stone.

A 1-cu. yd. General shovel loads the stone into three 3-ton International trucks for transportation to the primary crusher. A 1-cu. yd. Osgood shovel is also available for loading trucks. A 3- x 10-ft. manually controlled Austin-Western grizzly feeder, discharges the stone to a 21- x 38-in. Austin-Western jaw crusher, which is powered by a 105-hp. Waukesha gasoline engine. This

crusher reduces the stone to approximately 3 in. and discharges to a 24-in. Barber-Greene belt conveyor, 60-ft. centers, powered by a 7½-hp. Century motor. The stone is conveyed to a 36- x 60-in. Williams hammermill, driven through V-belt, by a 225-hp. 6-cylinder gasoline Twin City power unit.

Stone discharged from the hammermill is transported by a 24-in. Barber-Greene belt conveyor, 75-ft. centers, powered by a 15-hp. Century motor, to a 3- x 12-ft. Seco double-deck vibrating screen, powered by a 5-hp. Century motor. This screen is located directly over an 80-cu. yd. Blaw-Knox steel bin for agricultural limestone. The screen has ¾-in. and ¾-in. square openings on the top and bottom decks, respectively. Oversize from both screen surfaces goes to a 40-cu. yd. Butler steel bin located next to the agstone bin for storage of road stone. The throughs from the bottom screen go directly to the agricultural limestone bin.

(Continued on page 92)



Left: Dumping stone to primary jaw crusher. Right: Conveyor carrying stone from primary jaw crusher to hammermill. Conveyor to left goes to sizing screen over steel bin

How to Crush

330,000 TONS OF CLINKER AT NO COST FOR REPLACEMENTS

"We have put approximately 330,000 tons of clinker through the Tel Smith Gyrasphere since installation of the crusher in March 1940. Operation has been entirely satisfactory and we have not found it necessary to replace any part of the Gyrasphere."

— PORTLAND CEMENT COMPANY *

* NAME ON REQUEST



TELSMITH

Gyrasphere SECONDARY CRUSHER

Crushing Portland cement clinker...to a minus $\frac{3}{8}$ " or minus $\frac{1}{4}$ " product...330,000 tons of it...over four years of steady crushing...but not one cent for repair expense, except for replaceable oil filters! The crusher is a Tel Smith Gyrasphere Secondary Crusher. And its owner is a mid-western Portland cement company (name given on request).

In their system of handling, clinker goes from storage to the Gyrasphere crusher...and then direct to the

clinker mills. Owing to limited storage space, clinker is fed to the crusher very hot...over 300 degrees! The crusher gets hot, too—its lubricating oil is water-cooled. In the Tel Smith Gyrasphere *double protectors*... four flexible labyrinth seals plus two piston rings...cut oil and maintenance costs to a new low.

Find out *how* you can get finer crushing, continuous operation, greater capacity...with less trouble, less power, less upkeep. Get Bulletin Y-11.

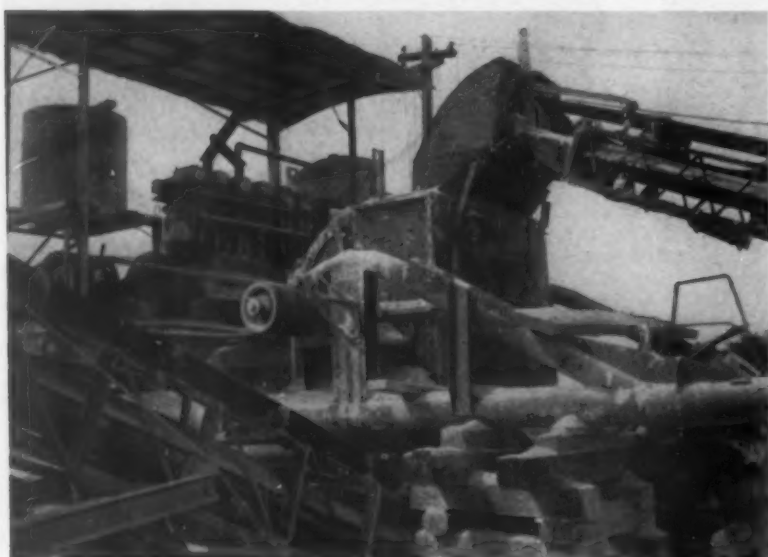
Y-4

TEL SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N.Y.	211 W. Wacker Drive Chicago 6, Ill.	713 Commercial Trust Bldg. Philadelphia 2, Pa.	19-21 Charles St. Cambridge 41, Mass.	G. F. Seely & Co. Toronto, Ont.	Mines Eng. & Eqp. Co. San Francisco 4—Los Angeles 14
Brandeis M. & S. Co. Louisville 8, Ky.	Charleston Tractor & Eqp. Corp. Charleston 22, W. Va.	Roanoke Trac. & Eqp. Co. Roanoke 7, Va.	North Carolina Eqp. Co. Raleigh & Charlotte, N. C.	Wilson-Wecamer-Wilkinson Co. Knoxville 8 and Nashville 6, Tenn.	

Printed in U.S.A.



Above: From hammermill the stone is conveyed to double-deck vibrating screen over 80-cu. yd. steel bin; oversize goes to smaller bin. Below: Hammermill driven by belt from gasoline engine

Production of agstone may be increased by taking stone from the road stone bin and returning it to the crusher for further reduction.

A 30K Caterpillar Diesel-electric generating set provides power for the screens, conveyors, and three Rex water pumps. These pumps have a suction and discharge of 6-in., 3-in., and 2-in., respectively, and are used to remove water from quarry.

Mr. Park plans to triple his present production next year with the addition of a 54- x 70-in. hammermill, another set of screens, another storage bin, and the necessary belt conveyors, which will be installed this winter in anticipation of next year's demand.

No Gas—No Cement

UNIVERSAL ATLAS CEMENT CO., closed down its Hannibal, Mo., plant in advance of its scheduled plan when the WPB ordered the curtailment of gas used to fire the kilns.

Revamping Boilers

(Continued from page 64)

ous 1½-in. solid shaft rolls. All lifting of ties, timbers, and pulling of the boiler was accomplished with an electric hoist.

Fig. 7 shows No. 2 boiler in position ready to be pulled off the cribbing across the roof and over old No. 3 boiler into its permanent position. In the background, old No. 1 boiler, now No. 3, can be seen, together with the brick work and steam header. This boiler (new No. 3) and No. 4 boiler have been our only source of power during this operation period, beginning July 27, 1944. The No. 4 boiler back of No. 3 has a temporary corrugated iron roof over it.

Fig. 8 shows the roof over which No. 2 boiler was taken and some of the cribbing on the concrete foundation on which the boiler was placed. It also shows the cable line for moving the boiler. The winch is located

behind the boiler, setting on the newly poured roof.

Fig. 9 shows another view of the end and side of the boiler. The 100-ton jack is in position, for at this time, the 10-in. H-beam track was being moved north.

The remarkable features about this entire enterprise are the following facts:

1. Each boiler was moved by an entirely different crew of men, with the exception of Chief Engineer E. R. Cheek who was in charge of the project and his assistant Oscar Maybery.
2. In each of the two cases, the boiler was given the cold-water test before it was moved and when the boilers were relocated in permanent position standing on their own legs, neither boiler showed any sign of leakage.
3. Both boilers were kept practically level during the entire period of raising, moving, and letting them down on the new foundations.
4. Accidents during the entire job were at a minimum. There were a few minor first aid cases, caused by dust in the workers' eyes or scratches, but none required medical attention and there was no lost time.
5. The entire brick work connected with this change was done by plant employees, consisting of a few cement plant trained brick men and common laborers, under the direction of G. W. Cross, superintendent, and his operating foremen, Art McClelland and Jim Smith.

The entire program will not be completed for some time to come, as it also includes the installation of three Buell dust collectors, construction of a concrete building over the three raised boilers and moving of many of the boiler accessories. Eventually it will include raising the fourth boiler (which is still on the ground floor) to the same height of the other three boilers, and the building of a concrete stack to handle any of the excessive kiln gases when the heat is not required.

Much credit for the success of the undertaking should be given to D. M. Tyler, vice-president and general manager of the company, who had sufficient faith and confidence in his supervisory personnel and employees to approve undertaking the project and the methods adopted. The reward was a job well done.

Lubrication of Air Tools

THE November issue of *Lubrication* published by The Texas Co., New York, N. Y., is devoted to the subject, "Lubrication of Portable Air Tools." So many air-operated tools are used in the rock products industry that the attention of our readers is called to this very informative issue of *Lubrication*.

Three HELTZEL Bulletins For Post-War Concrete Construction Equipment

These bulletins contain all the latest information on concrete construction equipment, including new war-time developments.

Bulletin A-20 . . . Steel Forms for building concrete curbs, curb and gutters or sidewalks. A visual demonstration of the equipment required for all types of street improvements.

Bulletin B-19 . . . Steel Forms for Concrete Highway and Airport Construction. Shows the attachments available for constructing all types of curbs, etc., at the time the pavement is laid.

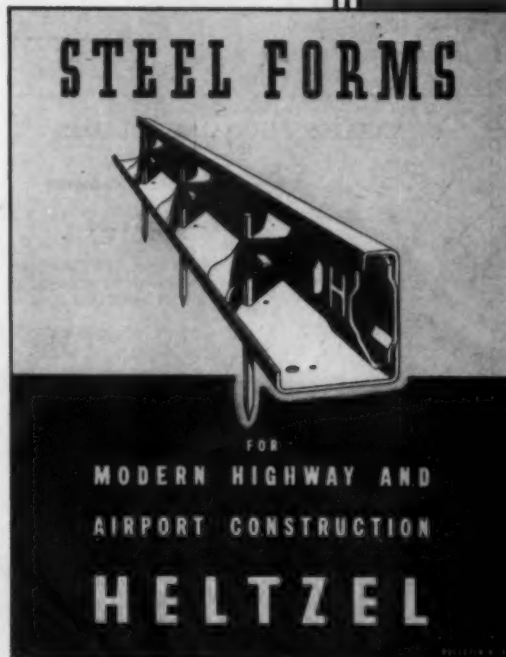
Bulletin C-34 . . . Portable Bins. Complete detail and data on batching plants from 52 to 100 tons capacity for either batch-truck or truck-mixer operations.

Catalogs and data are available for any size Central Mixing Plant . . . Truck Mixer Charging Plants . . . Portable or Stationary Bulk Cement Batching Plants or Tanks . . . Steel Storage Bins . . . Sub-grade Planers and Testers . . . Concrete Buckets . . . Joint Installing Machines and Materials.

Information that is vital to every post-war planner. Send for your copies today . . . there's no obligation.



**Bulletin A-20
Street Improvements**



**Bulletin C-34
Batching Plants**

**Bulletin B-19
Highway &
Airport Forms**

HELTZEL

Type One
PORTABLE
BATCHING
BINS

Chemists' Corner

Charts Reduce Laboratory Calculations

By C. J. KNICKERBOCKER

Determination of cement slurry moisture and fineness, coal moisture, and flue gas analysis has been simplified by the use of charts

ILLUSTRATED herewith are charts which have been found useful by chemists in making quick calculations of every-day problems with which cement and lime chemists are confronted.

Water Temperature Graphs

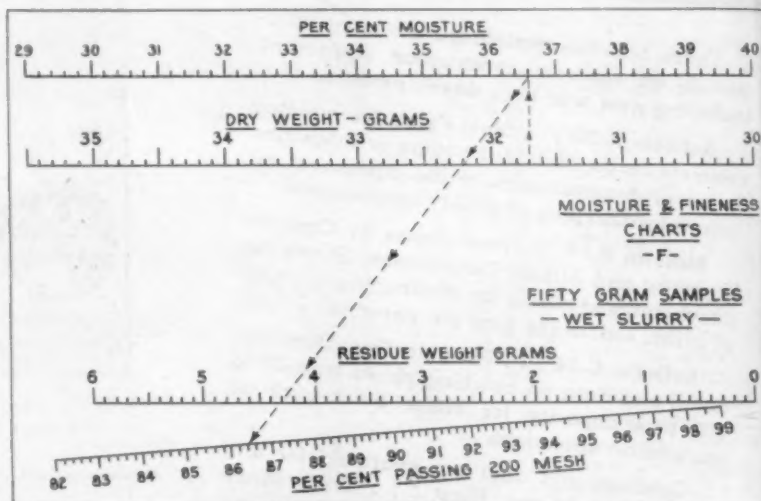
It is often desirable, for example, to operate combustion calorimeters at a fixed temperature in regard to the room temperature. Chart H under the heading, "Water Temperature Adjustment Graph," allows a rapid approximation to be made of the quantities of cool and warm water required to effect a desired blend.

Example—"H":

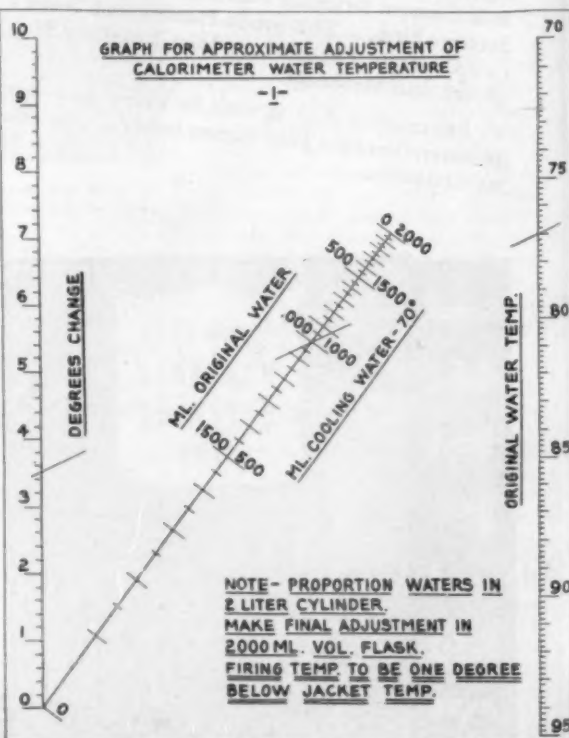
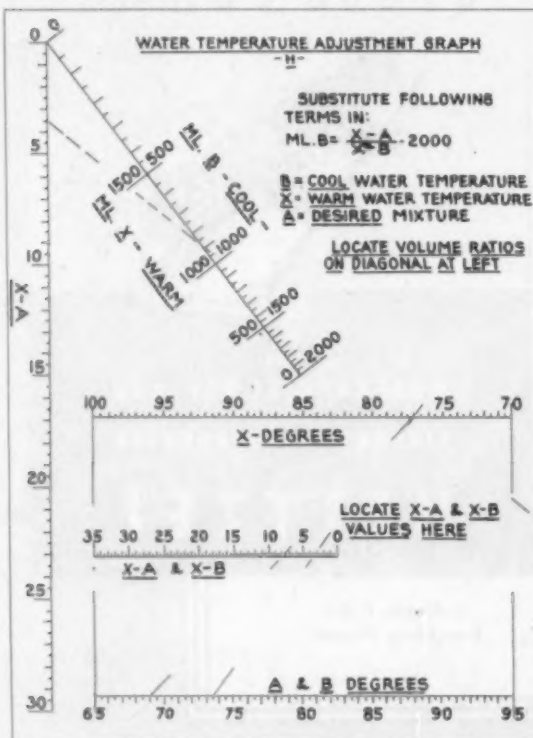
2000 ml. of 73.5 deg. water are required. Waters of 77 deg. and 69 deg. are available.

ML. cool water = $77.0 - 73.5 / 77.0 - 69.0 \times 2000 = 875$

ML. warm water to make balance.



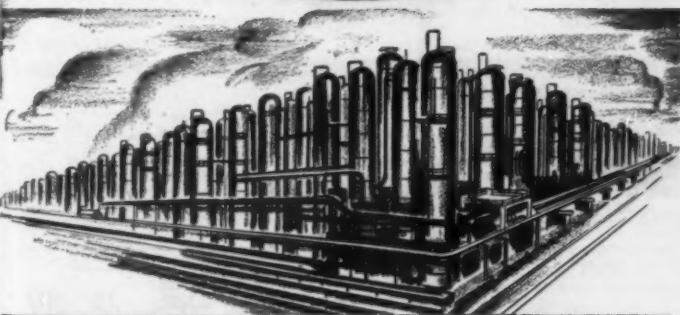
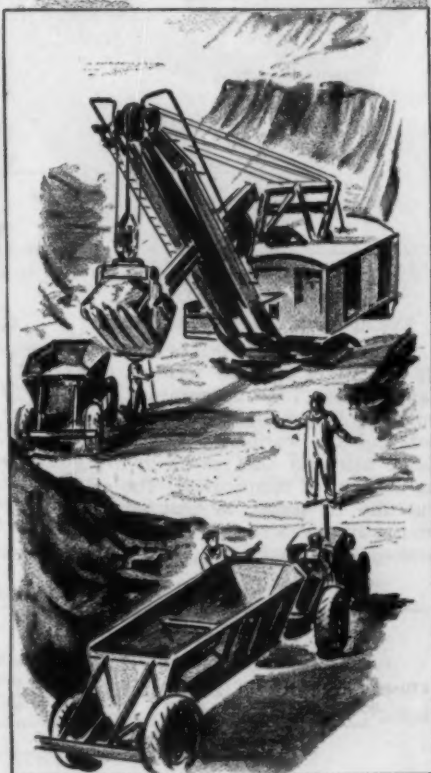
Cement slurry moisture and fineness chart



Charts H and I permits rapid approximation of quantities of cool and warm water required to effect a desired blend

Do you know that . . .

SINCLAIR PRODUCING OIL WELLS IF PLACED END UNDER END WOULD REACH TO THE CENTER OF THE EARTH—MORE THAN 3,500 MILES. SINCLAIR RANKS AMONG THE LARGEST PRODUCERS OF CRUDE OIL.



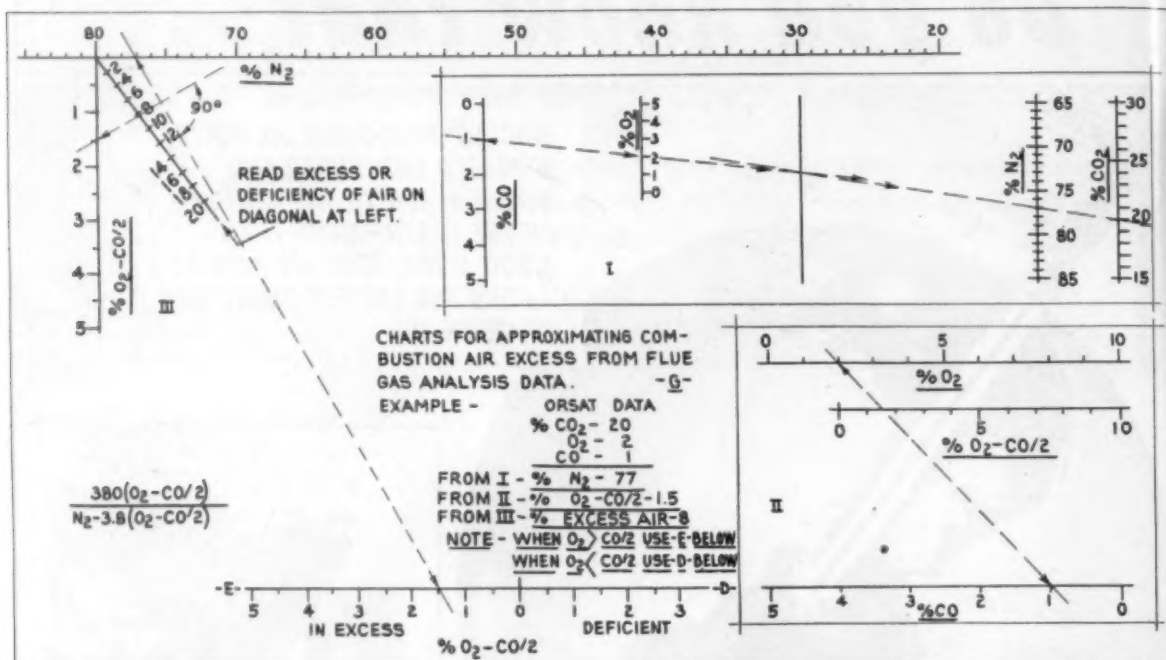
SINCLAIR'S 10 GREAT REFINERIES, IF MASSES TOGETHER, WOULD COVER AN AREA OF 2,300 ACRES—THE APPROXIMATE AREA OF A CITY OF 100,000 POPULATION. THESE REFINERIES MANUFACTURE A FULL LINE OF QUALITY PETROLEUM PRODUCTS FOR ALL MILITARY, INDUSTRIAL AND GENERAL USES.

FOR SAFE LUBRICATION OF EQUIPMENT UNDER HEAVY DUTY OPERATION SINCLAIR PROVIDES SPECIALIZED MOTOR OILS AND GREASES . . . ALSO TEN-OL 200 PREPARED SPECIFICALLY FOR DIESELS, DIESEL-POWERED BUCKETS, SHOVELS, AND BULLDOZERS.

SINCLAIR IS EQUIPPED TO SERVE YOU BETTER!

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

CHEMISTS' CORNER



Flue analysis charts used in connection with Orsat analysis and automatic CO_2 and CO recorders

Example—"I," see chart:

Desired to cool 77 deg. water with 70 deg. water to make 2000 ml. that is 73.5 deg. This temperature presumably is low enough to compensate for the warming effect of the bomb assembly and results in firing at the desired temperature. The calculation is similar to that of "H" and as indicated on the graph, equal amounts are required.

Cement Slurry Moisture and Fineness Chart

This chart is intended to replace the systems of tables used in many laboratories for this purpose. It is rapidly operated and offers a solution comparable in accuracy with that of the balance usually employed for the weighings.

Example solution:

Problem—

50 grams of slurry, when dried, weighs 31.7 grams.

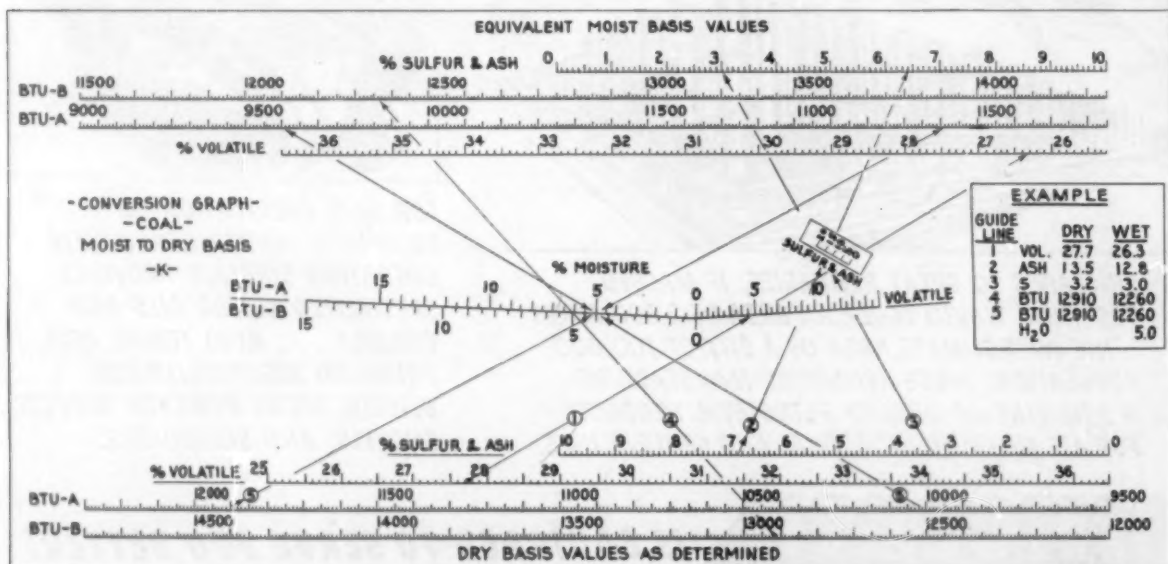
50 grams of slurry is sieved and the dried residue weighs 4.3 grams. Find percent moisture and percent dry slurry passing sieve.

Solution—

$2 \times (50.0 - 31.7)$ equals 36.6 percent moisture.

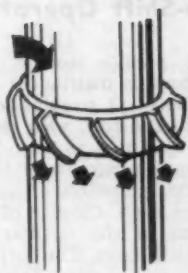
$100 - (2 \times 4.3 \times 100/100 - 36.6)$ equals 86.4 percent passing.

(Continued on page 98)



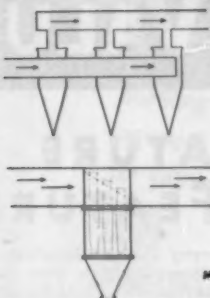
Graph for converting coal analysis values from the basis at moisture content of analysis sample to that of moist basis as received

You can have ALL
these important advantages
by installing a MULTICLONE
for Dust Recovery



Efficiency! The unique and patented vane which distributes the gases in the MULTICLONE collector tube makes possible the compact nesting of multiple small diameter tubes. Smaller radius of small tubes increases centrifugal forces, throwing out greater proportion of particles 10 microns and less as well as the larger particles. Result—high total recovery!

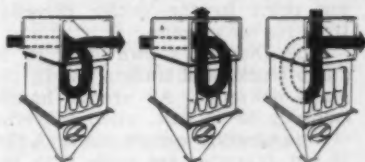
CONVENTIONAL CYCLONE



MULTICLONE

Compactness! No other unit of comparable performance is as compact as the MULTICLONE, either in square footage or cubic footage. Thus, you can often fit the MULTICLONE into small areas and waste spaces, effecting important savings whether the installation is in new structures or existing plants.

When purchasing recovery equipment it's a good idea to consider all factors when making your selection. But whether you base your decision on a combination of requirements—or on any one factor alone—you'll still find in the MULTICLONE the combination or individual factor you require for your plant.



Adaptability! Here's an important factor to keep in mind—adaptability of MULTICLONE to installation requirements. In the MULTICLONE you can have either side-inlet side-outlet, side-inlet top-outlet or even top-inlet side-outlet duct connections... whichever best meets your space restrictions.

Easy Maintenance! The MULTICLONE has no filters or screens to clean or replace, no high speed moving parts to maintain and requires no supervision. In addition, single hopper for entire bank of tubes simplifies collection. Complete unit is readily accessible for inspection or servicing. These are some of the features that keep MULTICLONE operation and maintenance at a minimum throughout years of heavy duty high recovery service!



Before selecting any recovery equipment send for this free booklet which gives the complete story on MULTICLONE advantages in fly ash elimination...

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Office: 1806 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 140 S. DEARBORN ST., CHICAGO 5
HOBART BUILDING • SAN FRANCISCO 4, CALIFORNIA
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

Coal Analysis Conversion Graph

(Continued from page 96)

This graph is used for converting coal analysis values from the basis of moisture content of the analyzed sample to that of the moist basis as received, or purchased. A similar graph converts to an ash free basis.

As shown, one alignment suffices for each operation. The original size being 9 in. x 19 in., the calculations may be carried to an extent exceeding the accuracy of reading the usual coal calorimeter thermometer, in terms of corresponding B.t.u. content.

The diagonals corresponding to the base line used are intersected at the moisture content corresponding to the difference between the analyzed coal moisture content and the moisture content of the coal as received at the scales. It is assumed that corrections have been made for free or combined moisture in the analyzed sample.

Flue Gas Analysis Charts

Orsat analyses are often utilized in many cement plants in conjunction with automatic CO₂ and CO recorders. An expression of the analysis

data in terms of excess air is generally the desired end. The time of the analyst is saved by using a graphical solution method.

The computations required in the example given are:

N_2 equals $100 - (CO_2 + O_2 + CO)$ or $100 - (20 + 2 + 1)$ or $77 O_2 - CO/2$ equals $(2 - \frac{1}{2})$ or 1.5.

Substitution in
 $380 (O_2 - CO/2) / N_2 - 3.8 (O_2 - CO/2)$

Gives

570/71.3 or 8 percent excess air

A simple means of alignment of values on part 3 of the chart* is by use of an 8- x 10-in. sheet of cellulose acetate, cross sectioned 1/4-in. squares, the required 90 deg. solution lines being readily selected.

*Original graph size of 9 in. x 17 in. referred to above.

Two-Shift Operation

(Continued from page 66)

The plant's storage capacity of 2000 tons is distributed into 18 all-steel bins—12 circular, conical-base, four to the row, with the six interstices also used as bins. The circular bins have a capacity of 150 tons each and the interstices of approximately 30 tons each. Closure of the conical bottoms of the circular bins is by clamshell gates. The interstices have sliding and slotted gates to permit their sand content to drain excess moisture. This drainage usually takes about 12 hours. The slots are tapered to eliminate the possibility of clogging. The drained water escapes to pit sump through a flume.

Driveways extend the entire length of plant, one under each row of the circular bins. The center driveway has a 100-ft. Buffalo truck scale of 50-ton capacity. This scale is equipped with a projection device that permits the scaleman to read the Howe weightograph at any loading point in the center driveway from his scale house.

Blue Diamond's own fleet of 50 dump trucks and trailers handle the plant deliveries. All trucks handle loads up to 30 tons, when deliveries of this quantity can be made. A few 10-ton deliveries are made with International K 11 trucks.

Rehandling of materials and loading from stockpiles is done by a 1/2-cu. yd. Browning truck-mounted gasoline crane and a 1 1/2-cu. yd. Cummins-Diesel powered Lima crawler crane. All-purpose water is supplied from a deep well by a Pacific pump with a 100-hp. G. E. motor.

Design and construction supervision of the El Monte plant is the work of W. G. Bradley, vice-president in charge of the engineering and operating department of Blue Diamond Corporation, Los Angeles, Calif. Mr. Bradley has had Superintendent Tom Dougherty as his right-hand man in charge of the plant since its completion.

Simplicity
GYRATING
SCREENS

MEASURE IT'S VALUE

FEATURE BY FEATURE

The Superior value of Simplicity Gyration Screens shows itself by their outstanding individual features. These features are the reason why user after user reports that Simplicity Gyration Screens make cleaner separations to closer tolerances with very little upkeep. Here are some of the outstanding Simplicity features . . .

✓ **Rubber-Cushioned Power**—Resilient rubber mountings support screen corners so all positive gyrating action is imparted to screen decks. This eliminates excessive structural wear, increases screening efficiency.

✓ **Screen Cloth Whip Eliminated**—Screen cloth is stretched taut all four ways over bars which are crowned both sideways and endways. Screen cloths last longer. Screening efficiency is increased because screens cut more cleanly through material, remove under-size more positively and eliminates blinding.

✓ **Adjustable Angle**—Setting can be changed as much as ten degrees by simple corner adjustment which does not shift the I-Beams. Each successive deck is not 2 1/2 degrees steeper

than one above to aid the smaller oversize particles in moving down against counterflow screening action.

✓ **Heavy-duty Bearings**—The complete gyrating assembly is carried by heavy duty ball or roller bearings in dust-proof and water-proof housings protected by special labyrinth bronze seals.

✓ **Concentrated Screening Force**—Counterbalanced eccentric shaft—original with Simplicity—is machined directly on the shaft and exactly balances the weight of the entire vibrating screen deck assembly. This "builds-in" positive action with perfect smoothness.

✓ **Durable Construction**—Heavy, I-Beam frame is tied together with rigid steel channels, sturdy, all-steel construction permits larger capacity with minimum of repairs.

Simplicity
ENGINEERING COMPANY • DURAND, MICH.

Phosphate Grinding

(Continued from page 84)

The effect of excess moisture is best observed when mills are fed directly from the dryers, without the benefit of losing additional moisture by diffusion. The ground particles agglomerate in the moist air of the mill housing, created by evaporation from disintegrating lumps with moist interiors, and are not so readily picked up by the air, hence reducing the effectiveness of the pneumatic system. Furthermore moisture condenses on the cooler parts of the system restricting flow and upsetting the pressure differentials required throughout the entire circuit. Those cyclones which vent into a Sly bag filter or similar dust collector, instead of into the atmosphere, soon clog the bags with wet dust. Aside from the obvious result, this also creates a back pressure manifesting itself clear back to the mill which normally operates under a slight vacuum. These combined direct and indirect phenomena may cause a drop of 25 percent in capacity if the mill is fed continuously with hot moist rock for several shifts.

Certain markets do not require so fine a phosphate as that for direct application to the soil and therefore considerable tonnage is ground to 90 percent through 200-mesh. A comparison under operating conditions which were made as nearly identical as is practical, has shown that the grinding rate was 23 percent to 25 percent greater for 90 percent through 200-mesh than that for 85 percent through 300-mesh. It was also noted that the power consumption was only 5 percent greater on the coarser grinding than on the finer.

Power requirements are high as compared to other operations, consumption being on the order of 22 kw. per ton of rock ground. High maintenance costs and the necessity for close control add up to make production costs probably in excess of 70c per ton.

Start Agstone Concern

HERMAN SNATER and ARLING E. SMITH have formed a company to produce agricultural limestone in several quarries in the State of Iowa. The company probably will maintain headquarters at Winterset, Iowa, but the first quarry is being opened up on a three-acre site a half mile west of Macedonia, Iowa. It is planned to have the plant in operation around the first of February with a production of about 110 tons an hour. Mr. Smith is the Social Welfare Director at Winterset, and Mr. Snater was formerly in the construction business with headquarters at Ackley, Iowa, and more recently has represented Pennsylvania-Dixie Cement Co., in Iowa.

Nitro Starch Base HIGH EXPLOSIVE EFFICIENCY

IN MINING · QUARRYING · LOGGING · CONSTRUCTION

Plus THREE ADVANTAGES FOR YOU!

1 WILL NOT PRODUCE HEADACHES from handling... reduces discomfort from breathing muck pile fumes. Better working conditions for you and your men!

2 WILL NOT FREEZE or leak at Arctic or Tropic temperatures. Maintained high efficiency... anywhere... anytime!

3 WITHSTANDS IMPACT in high-powered Rifle Bullet Test. Greater safety for workers!



• Your men will give a hearty "O. K." to Trojan, the explosive that does not produce headaches from handling. And you will be equally enthusiastic because Trojan reduces the discomfort from breathing muck pile fumes—creates better working conditions for the workers—improves the efficiency of all who actually handle explosives or work in the area where explosives are used.

TROJAN POWDER COMPANY

One of America's Oldest High Explosives Manufacturers

PLANTS: SEIPLE, PA. • ROBERT, CAL. • MAGAZINES STRATEGICALLY LOCATED THROUGHOUT THE NATION

OFFICES: ALLENTOWN, PA. • SAN FRANCISCO, CAL. • LOS ANGELES, CAL. • PORTLAND, ORE. • NEW YORK, N. Y.

Job Evaluation

(Continued from page 88)

in the wage incentive plan was one truck load of uncrushed stone as delivered by the quarry crew to the primary crusher. The standard production per hour was set at 12.9 loads per plant operating hour, that is 12.9 loads for every hour the plant was scheduled to operate during the payroll period regardless of shutdown time.

Thus, if the plant is scheduled to operate 54 hours during the payroll period, the standard for that period would be 54 times 12.9 or 696.6 loads. If during this period a total exceeding the standard is produced, the

productivity percentage is figured as follows:

Week's standard production = 696.6 loads
Week's actual production = 745 loads
Percentage of productivity = 745/696.6

= 106.9 percent

Since the production exceeds standard, the crew earns an incentive bonus based on the 6.9 percent over standard.

It should be noted that the standards used in one quarry are not applicable to another quarry. The reasons are found in the different types of equipment used, the varying hauling distances, and differences in other

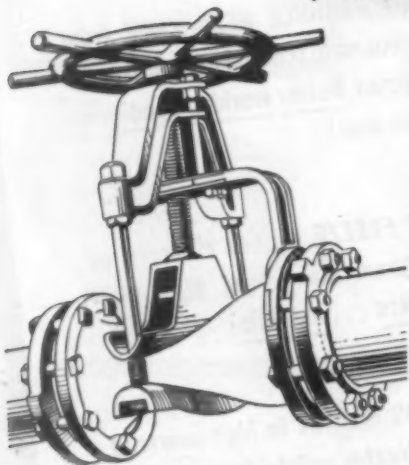
important factors that influence production.

Effective Production Methods Precede Wage Incentives

Before setting up any wage incentive system it is necessary to correct any inefficient production practices so that standards established will be based on sound methods. If one were to establish a wage incentive system where inefficient methods and practices were used, such a system would place a premium on unsound operation. A careful survey was made of one quarry's operations to discover bottlenecks and the maximum possibilities of men and machines. To attain maximum reduction of man-hour and machine-hour time, the down time was analyzed to discover elements of waste that could be corrected. An analysis of the shovel report for the 22 working days of one month showed a productivity rate of 54.4 percent with 45.6 percent of down time, that is 27.5 percent of total available hours, or 50.85 percent of productive hours, was consumed in waiting for cars to be spotted for loading. If this waiting time was reduced by only 15 percent, and the present rate of production was maintained, there would be 19,668 additional tons handled during the 22 days, at no increase in cost or labor. It was found that the locomotive which was being used to haul stone was also being used for spotting cars. By employing capstans for spotting cars and using the locomotive only for haulage, the total complete time cycle of 95 minutes was cut down to 37 minutes. The accompanying chart shows how 61 percent of time was saved in the complete cycle by reducing locomotive time of operation. When a wage incentive plan was installed on the basis of these rectified procedures, this 15 percent of lost time was saved. Because of increased output as a result of savings in time and of increased labor efficiency due to wage incentives, it was calculated that \$150,000 would be added to yearly profits.

A common weakness in all industrial management today is the failure to recognize the urgent need for measuring and rewarding individual performance and progress and for establishing proper controls for personnel as well as for production. Procedures and standards set up for this purpose must be based on data determined by scientific measurement and modern engineering analysis. Labor is becoming increasingly important as a vital factor in management and is taking more and more of the costs. Whether in war or peace time, industrial management should focus much of its attention on the labor problem, on how to utilize manpower to the best advantage, how to stimulate it, how to work with employees in the most harmonious and productive way. No modern busi-

MASSCO-GRIGSBY Pinch VALVES



for
ABRASIVE
and
CORROSIVE
PULPS and
LIQUIDS

NO METAL CONTACTS PULP OR LIQUID

Useful for solutions which are highly corrosive or which crystallize at normal temperatures and must be handled at up to 300°F; or for mixtures of solutions or solids which are both corrosive and abrasive.

Recommended for transfer lines, controlling flow in plant, delivering product to storage or cars or for handling fine dry materials. Valve shuts tight on solid particles.

These valves resist wear more than metallic parts of gate or plug valves. No packing glands. Freezing temperatures will not destroy sleeve. Easy to operate.

1", 2" and 3" for continuous pressures to 100 lbs.; 4", 6", 8", 10" and 12", up to 150 lbs. Send for illustrated folder.



MASSCO Jr.
Rock Bit Grinder

Other Products—MARCY Ball, Rod and Tube Mills; Genuine WILFLEY Concentrating Tables; MASSCO-McCARTHY Hot Millers; Rock Bit Grinders; Belt Feeders; Density Controllers.

DENVER SALT LAKE CITY EL PASO NEW YORK CITY	The Mine & Smelter Supply Co.	CANADIAN VICKERS, LTD. MONTREAL W. R. JUDSON SANTIAGO, LIMA
--	--	---

ness methods have done more to promote the right kind of employee relations, to increase production, to overcome the handicap of manpower shortage, than *job evaluation* and *wage incentives*. Together they have done a tremendous job in countless industries throughout the country in increasing production and net profits by solving the labor problem.

Ohio Agstone Meeting

PRODUCERS and distributors of liming materials in Ohio recently held a meeting on January 5 at the O.S.U. administration building at Newark, Ohio. The meeting was sponsored by the Processed Limestone Association and Ohio University Department of Agronomy.

Starting at 9:45 a. m., the program included talks on "Relation of Soil Conservation Districts to the Future of Ohio Agriculture," J. A. Silpher; "Liming Increases Farm Income," John H. Sitterley; Forecasts of Future Lime Needs and Report of Survey of Processors," R. D. Lewis, and "The 1945 AAA Limestone Program," Dale Williams. All speakers were from the university staff, with the exception of Mr. Williams, who is with the Agricultural Adjustment Agency in Columbus.

At a 1:30 p. m. meeting, the group was welcomed by James Eells, president of the Processed Limestone association. Other speakers were: "Year-Round Spreading of Limestone," Earl Jones of the university; P. E. Heim, Carbon Limestone company, Youngstown; "Credit Systems for the Purchase of Liming Materials," Paul A. Warner, Knox County Savings bank, Mt. Vernon, and "Trash Mulch Seeding of Alfalfa Mixtures on Old Hay and Pasture Fields," Robert E. Yoder, chief of the department of agronomy, Ohio Agricultural experiment station, Wooster.

The use of agricultural liming materials in Ohio rose from 103,000 tons in 1932 to 1,521,000 tons in 1943, yet the usage is still considerably short of the requirements.

Correction

ON PAGE 90 of ROCK PRODUCTS for December, 1944, under the heading, "More Efficient Lime Plants Needed in Latin America," Oliver Bowles, Chief, Nonmetal Economics Division, Bureau of Mines, calls our attention to a discrepancy in the figures on United States production for 1943. The figures are the Bureau's preliminary 1943 statement and not the final figures. For chemical lime, the total should be 4,307,799 short tons and not 4,075,000 tons as given. The 1943 total of all types of production should be 6,596,615 short tons.

Fire Destroys Tow Boat

PORTSMOUTH SAND AND GRAVEL CO., recently lost a towboat in a fire which was caused by a motor back-firing. The loss was about \$3000.

This Pulverizer Hammer Head Can't Fly Off or Drop Off

The design of the Amsco "Clark" renewable tip pulverizer hammer makes it impossible for the tip to

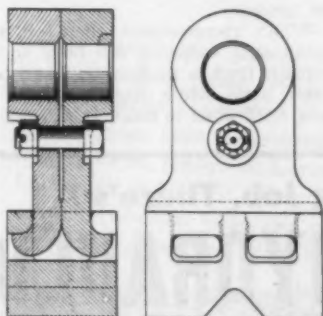
metal in the head is actually used before replacement is necessary. A pair of shanks outlasts many tips.

The tip is easily replaced by removing the assembly bolt and spreading the shank halves apart, unhooking the tip. A new tip is installed by reversing this operation. The assembly bolt is locked with a standard split cotter pin.

The proper time for reversing hammer tips or for replacing worn out tips is plainly indicated because the holes in the tip sides show when the shank hooks are about to be attacked.

The same tip can be used with longer or short shanks as they vary in different makes of mills.

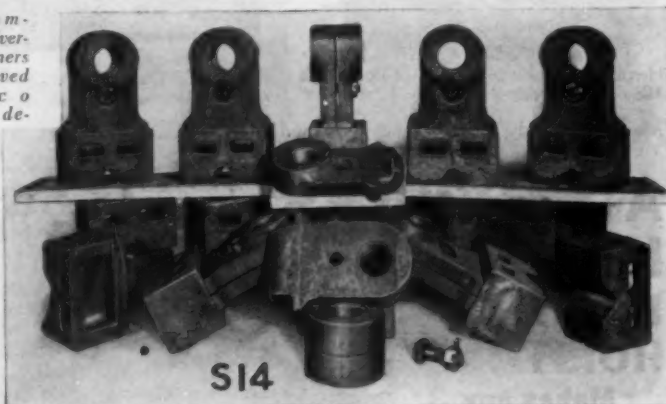
The unmatched durability of tough, work-hardening manganese steel, which is used for both the tips and shanks of Amsco "Clark" pulverizer hammers.



Showing construction features of Amsco "Clark" reversible and renewable tip pulverizer hammer. (Patent applied for)

come off as long as the shank hangs from its supporting rotor pin. Our drawing shows how the head or tip is secured to the shank by the two hooks which terminate each shank half.

S-14 Complete pulverizer hammers of improved Amsco "Clark" design.



There are other unusual features in this three-part hammer:

Because the head is reversible end for end, about 75% of the

Please give us the pulverizer make and the pattern number on your present hammers when inquiring for prices.

Amsco Conservation Welding Products save for quarries and mines—Send for Bulletin 941-W.

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

AMERICAN
Brake Shoe
COMPANY

POST-WAR TRENDS

From an address presented before the Boards of Directors of the National Sand and Gravel Association and the National Ready Mixed Concrete Association

COL. WILLARD T. CHEVALIER, publisher, *Business Week*, New York City, one of the featured speakers at a joint session of the Boards of Directors of the National Sand and Gravel Association and the National Ready Mixed Concrete Association, spoke on the subject, "An Appraisal of Postwar Trends."

While acknowledging that postwar schedules have been upset and that

war production will be scheduled as if the war never will end, Col. Chevalier called attention to the inevitable transition period that will come and pointed to the effects it will have on industry.

When reconversion comes it will mean that industry will have to reconvert from a production basis to a sales basis while looking ahead to new conditions to meet. It will not do

to revert to what has gone before, he emphasized. While catching up with deferred demands, a firm foundation must be built for future business. He acknowledged that we will want wartime controls to be removed but speculated that we may have some new regulations when the war ends.

Insofar as planning is concerned, he emphasized that imagination will be required—there must be intelligent gambling in the absence of definiteness, rather than not go forward with plans.

If both wars end close together, Col. Chevalier said that estimates of unemployment range from 4,000,000 to 16,000,000 men and the latter figure could be equivalent to depression conditions. He said that 22 million people would be affected in the transition, which is almost half our normal employed population.

In discussing job opportunities, he cited figures to show the drastic decline in agricultural employment in favor of employment in commerce and the professions and services. There is the opportunity for putting men to work in the shortest time, he said, for no re-tooling or other delaying factors are involved.

Government must create the environment to help industry and, if industry fails in its responsibility to furnish adequate employment, he predicted there will be government jobs and their attendant restrictions.

The construction industry must be ready to handle a 12 billion dollar program and, a year ago, had equipment on hand sufficient to perform that job. The question now, he said, is the condition that construction machinery will be in when the time comes.

He believes that obsolescence will be a dominant factor in the postwar world. There will be a constant demand for new and more efficient ways to do a job. He believes that the construction industry is one of the best qualified to absorb demobilized veterans but cautioned that the biggest obstacle may be shortage of plans. In concluding, he said that capital will have to get to work to prove to the doubting world that our system of free enterprise works.

Readjusting the Veteran to Civilian Life

LT. COL. EMMETT G. SOLOMON, chief of the Veterans Personnel Division, Selective Service System, was scheduled to have addressed the National Sand and Gravel Association and the National Ready Mixed Concrete Association, but due to the cancellation of the conventions, the address was not presented. However, owing to the importance of the subject, an abstract is published, herewith.

Col. Solomon pointed out in his prepared address that about 50,000 men are now being returned each month to civil life from the armed forces. One-half of these are by reason of disability. As the need for

For Every Dumping Job, There's A HERCULES HYDRAULIC Dump Body and Hoist



Hercules Removable Side Rail Body With Hinged Rear Corner Post.



Hercules High Dumper—Power Up, Power Down, with 78° dumping angle. Hoist capacity 12 tons.

Many other body styles, in many sizes, and 6", 7", 8" and 10" Hoists, are available.

A HERCULES HYDRAULIC BOOSTER HOIST

Makes any
Truck A
DUMP
TRUCK



UNLOAD the EASY WAY! SAVE TIME, MANPOWER and MONEY by installing Booster Hoists under your Stake, Platform, or Special Bodies. 50° Dumping Angle will dump any material such as Coal, Grain, Earth or Sand. See your Hercules Distributor or Write

Hercules Steel Products Co. - Galion, Ohio

Manufacturers of Hercules Hydraulic Hoists, Dump Bodies, Split-Shaft Power Take-Offs and "Power-Chute" Hydraulic Coal Unloaders

men in both industry and agriculture is great, job opportunities are now plentiful, but as time progresses new complications will be introduced. Congress, in the "Servicemen's Readjustment Act of 1944" created a Veterans' Placement Service Board, naming the Director of Selective Service as a member. Other members are the Administrator of Veterans' Affairs, who is chairman, and the Chairman of the War Manpower Commission. The Retraining and Reemployment Administration, which was established to have general supervision and direction of the activities of all existing executive agencies (except the Veterans Administration) relating to retraining, reemployment, vocational education and vocational rehabilitation, was established within the Office of War Mobilization and Reconversion headed by former Justice Byrnes. In addition to Selective Service, other governmental agencies concerned with the reemployment problem include the Veterans' Administration, the Veterans' Employment Service, the War Food Administration, the Railroad Retirement Board and the Civil Service Commission.

"Congress recognized the reemployment problem," he said, "as having two aspects: (1) The veteran who wants his old job back, and (2) the veteran who never had a job, who does not want the one he did have, or whose job has disappeared since he went away. The Selective Service System has been given a responsibility in both fields.

"The initial responsibility, that of giving aid to restore veterans to their former positions, has been accepted in full by the Selective Service System. In carrying out the second aspect, that of obtaining new positions for the veterans, the services of the agencies of government mentioned above are being utilized.

"As for the veteran who wants his old job back, the law provides that he is entitled to reinstatement in his former position or in one equivalent in every respect, provided: (1) such a position was in the employ of a private employer or the Federal Government; (2) such position was not a temporary one; (3) he left the position subsequent to May 1, 1940, to enter upon active military or naval service in the land or naval forces; (4) he satisfactorily completed his period of training and service and received a certificate to that effect; (5) he is still qualified to perform the duties of such position; (6) he makes application for reemployment within 90 days after he is relieved from service, and (7) if such a position is in the employ of a private employer, the employer's circumstances have not so changed as to make it impossible or unreasonable to reinstate the veteran to such position or to a position substantially equivalent in every respect.

NAYLOR PIPE HELPS OTTAWA SILICA MOVE MOUNTAINS

Naylor light-weight pipe is at its best on tough jobs like the Ottawa Silica Company operation at Ottawa, Illinois. The greater strength, leak-tightness, safety and economy provided by Naylor's exclusive Lockseam Spiralweld structure, plus Naylor's advanced-type coupling medium make this pipe ideal for hydraulicking, sand and gravel conveying lines, high and low pressure water lines, ventilating lines and other similar operations.



Sizes from 4" to 30" in diameter.
Thickness from 14 to 8 gauge.
All types of fittings, connections
and fabrication.

Naylor
LOCKSEAM
SPIRALWELD PIPE

NAYLOR PIPE COMPANY

1237 EAST 92nd STREET, CHICAGO 19, ILL.

New York Office:

350 Madison Ave., New York 17, N. Y.

Sand Recovery

(Continued from page 57)

we are endeavoring to remove, evidently largely the 16- to 30-mesh, are too near to the size of the screen aperture or opening to do the most effective screening job.

According to Gaudin (Principles of Mineral Dressing*) the chance that an undersized particle will go through a square mesh screen aperture is expressed by the formula:

$$p = \left(\frac{a - d}{a + b} \right)^2 \text{ where}$$

a = the screen opening

*McGraw-Hill Book Co., 1939

d = diameter of particle (assumed to be spherical)
 b = diameter of wire
 $(a + b)$ = distance center to center of wire between openings

Using our assumed screen analysis, some 43 percent—nearly half—of the material we want to pass through our 16-mesh screen is in the 16- to 30-mesh size; or striking an average, say it would be about 24-mesh size (Tyler Standard) or 25-mesh (U. S. Standard). The screen opening for this size test sieve is practically 0.7 millimeters, which we will say is the average diameter of the particles we wish to screen out by means of a No. 16 (U. S.) screen.

This screen with medium heavy wire, has openings of 1.09 or say 1.1 mm. The diameter of the wire is 0.028 inch (0.028×25.4) or 0.7 millimeters.

Gaudin's formula then becomes:

$$p = \left(\frac{1.1 - 0.7}{1.1 + 0.7} \right)^2 = 0.05 \text{ or } 5 \text{ percent}$$

In other words the chance of a particle 0.7 mm. in diameter going through a 1.1 mm. square hole in a single drop on the screen is only 5 percent or about 1 chance in 20. Of course, that is the chance of a lone particle going down a screen. According to Gaudin's table, it would require about 100 chances to insure of its getting through. This means that if the particle had a chance at each successive screen opening, it would require 100×1.80 millimeters of screen length, or 180 mm. (7 1/4 in.) to insure screening it out. However, if the screen is vibrated so that the particle has a chance, say at only every third opening, the length of screen would have to be 21 3/4 in. As soon as we start loading the screen with other particles, these particles will interfere with one another, and the factors involved become too complex for anything like rational mathematical analysis. The best any one can do when it comes to probable screen efficiencies and capacities is to estimate on the basis of experience, and with assumptions based on experiments with various materials. There is as yet no general agreement on these factors among screen manufacturers and screen designers.

Efficiency of Screening

The efficiency of screen performance is generally defined as the ratio of the amount of undersized material that goes through the screen to the total amount of undersized material in the feed. In the case of screening through 16-mesh the Connecticut sand under discussion, there was 83 percent undersize, and most of this undersized material is around 0.7 millimeters in diameter, to be screened through a 1.1-mm. opening. For reasonably efficient screening the diameter of the material to be screened should be not more than one-half the screen opening. In this case it is more than 0.6.

It is doubtful then, if in this case the screening efficiency would be better than between 65 and 75 percent, or let us say 70 percent. The volume of feed to be screened we know is 40 percent of 50 cu. yd. per hr., or 20 cu. yd. per hr.

The formula for screen efficiency, based on the definition given above, can be readily determined to be

$$E = \frac{10,000 U}{uF}$$

where U = tonnage or volume passing through the screen (in this case the wasted undersize); F is the tonnage or volume of the whole feed, and u is the percentage of undersize

HARDINGE EQUIPMENT



MILLS: Conical Ball and Pebble Mills. Rod, Tube, Compartment, Batch and "Thermo-Mills." Bulletin 13-D.



CLASSIFIERS: Reversed current Air Classifiers for classification of dry materials; Counter-Current and Hydro for wet classification. Bulletins 31-C and 39-A.



THICKENERS: Single Unit or Tray Type Thickeners. Also Agitators, Clarifiers, and Sand Filters. Bulletin 31-C.



DRYERS: "Ruggles-Coles" Rotary Dryers, also Kilns and Coolers. Bulletin 16-C.



FEEDERS: Constant Weight, Weight Recording, Disc and Volumetric types. Bulletins 33-C and 43.

HARDINGE

COMPANY, INCORPORATED, YORK, PENNA.

NEW YORK

CHICAGO

SAN FRANCISCO

TORONTO

P-10 Rock Products

in the feed. The 10,000 is merely the figure required to convert the answer to percentage (100×100).

In this instance we have assumed the efficiency would be 70 percent, so

$$70 = \frac{10,000 U}{83 \times 20} \text{ or}$$

$$U = \frac{70 \times 83 \times 20}{10,000}$$

$$= 11.6 \text{ cu. yd. per hr.}$$

Since there was $0.83 \times 20 = 16.6$ cu. yd. of undersize in the feed and we have removed only 11.6 cu. yd., there is still 5 cu. yd. left with the oversize.

Assuming then we have taken out all the oversize and 5 cu. yd. per hour, or $\frac{1}{20}$ or 25 percent, of the undersize, say all in the 16- to 30-mesh sizes, we will have to correct our assumed analysis of the "manufactured" sand as follows:

60 percent bank—plus 40 percent scalped

	Parts	Parts
Plus 4-mesh	0.9 + 0.6 ..	1.5
4- to 8-mesh	3.3 + 2.2 ..	5.5
8- to 16-mesh	6.0 + 4.0 ..	10.0
16- to 30-mesh	25.8 + 4.3 ..	30.1
30- to 50-mesh	16.8	16.8
50- to 100-mesh	6.6	6.6
Minus 100-mesh	0.6	0.6

Totals 60.0 71.1

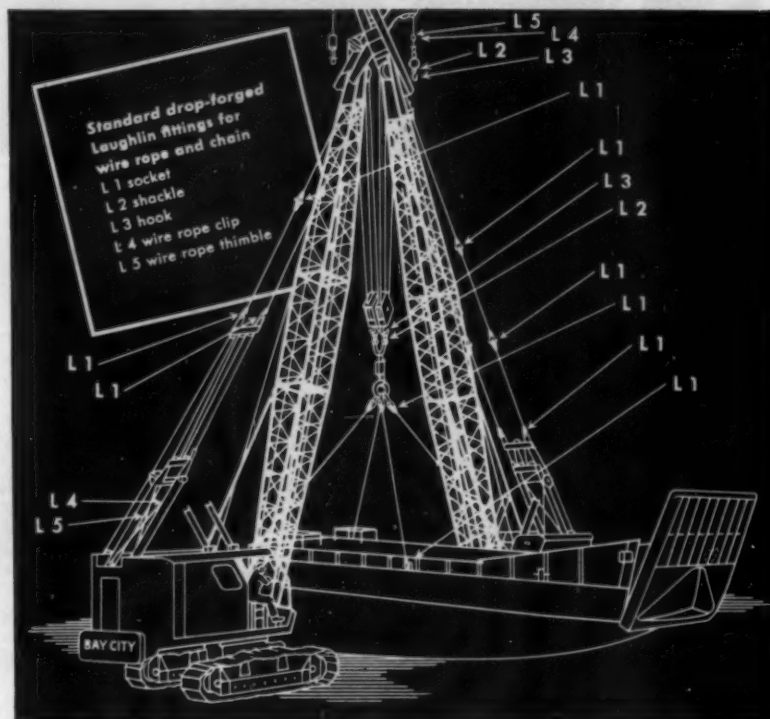
Now, if we reduce our new sand to "Percent Retained" and "Percent Passing" we have:

	Percent Retained	Percent Passing
$\frac{3}{8}$ -in.	0.0	100.0
No. 4	2.1	97.9
No. 8	9.9	90.1
No. 16	24.0	76.0
No. 30	66.4	33.6
No. 50	90.0	10.0
No. 100	99.2	0.8

This sand has a fineness modulus of 2.91, which is a pretty good concrete sand, but it still lacks minus 50-mesh sizes, as shown in Fig. 9, where we have plotted this sand against the usual federal government specifications. If the producer wishes to still further improve his product, he might put in a thickener or settling tank to recover the fine sands from his wash water.

It has to be assumed that enough water is used on the No. 16 vibrating screen to thoroughly wash off the sand grains finer than 30-mesh, which would tend to coat the coarser particles. Also, in a case like this, it is always a question whether 16-mesh or possibly a somewhat coarser mesh, like 12 or 14, might produce a more satisfactory result, so as to keep the size of particle to be removed less than one-half the size of the opening to be used. Another possibility is to use rectangular rather than square openings, since the screen function is scalping only.

SAVE TIME AND MONEY AT EVERY POINT



The L's mark the spots where you can save money in wire rope and chain fittings, by ...

1. eliminating "specials" — Laughlin has the most complete line of drop-forged standard fittings.
2. protecting ropes and chains — husky Laughlin fittings take their full share of the load.
3. lasting as long or longer than ropes or chains.
4. protecting lives, loads, plant equipment — as with Laughlin's unique Safety Hooks.
5. reducing installation time — 3 "Fist-Grip" clips do work of 4 and are quicker to install.

Protect your investment in wire rope and chain with quality fittings. Specify Laughlin — fittings that save you time, materials and money. Write for complete catalog. Address Dept. 4, THE THOMAS LAUGHLIN COMPANY, Portland 6, Maine. Laughlin fittings are distributed through mill, mine, and oil field supply houses.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS





in the center is Carl Brown, retiring president of A. R. B. A., and James Kelly, the new president, surrounded by friends extending congratulations

Road Builders Meet in Chicago

Discuss big highway-airport programs

CHICAGO was again host to the American Road Builder's Association, which held its 42nd annual meeting at the Stevens Hotel, Jan. 16 through 19, 1945.

CHARLES M. UPHAM, engineer-director, American Road Builder's Association, Washington, D. C., presided at the opening session. He introduced CARL W. BROWN, president of the A.R.B.A., and chief engineer of the Missouri State Highway Dept., who gave the president's report. Following this report, the new officers were installed.

New Officers

The following officers and directors were elected:

President: James J. Skelly, Media, Penn., contractor, who succeeds Carl W. Brown, chief engineer, Missouri Highway Department. Mr. Skelly for two years headed the Contractors' Division.

Regional Vice Presidents: Paul B. Reinhold, president, Atlas Equipment Co., Pittsburgh, Penn.; W. A. Young, Macon, Ga.; E. R. Galvin, president, Tyson Bearing Co., Massillon, O.; C. H. Purcell, director, California Department of Public Works, Sacramento; H. C. Whitehurst, director of highways, District of Columbia, Washington, D. C.

Directors, elected for three years, were T. H. Cutler, chief engineer, Kentucky Department of Highways, Frankfort, Ky.; E. S. Gillette, Gillette Publishing Co., Chicago, Ill.; O. S. Hees, engineer-manager, Kent County Road Commission, Grand Rapids, Mich.; H. C. Hofheimer, II, Norfolk, Va.; Theodore Reed Kendall, editor, Contractors' and Engineers' Monthly, New York, N. Y.; H. G. Sours, director, Ohio Department of Highways, Columbus, Ohio; Carl O. Wold, Peoria, Ill.

Division Presidents: Arthur F. Ranney, county engineer, Summit County, Akron, Ohio, County Highway Officials Division; Nathan L. Smith, chief engineer, Department of Public Works, Baltimore, Municipal Division; Charles W. Smith, Pensacola, Fla., was elected president, and L. W. Edison, Grand Rapids, Mich., vice-president of the Highway Contractors' Division; Paul Gregg Cochran, president, Buckeye Traction Ditcher Co., Findlay, Ohio, Manufacturers' Division.

HON. JENNINGS RANDOLPH of West Virginia, member, Committee of Expenditures in the Government Departments, U. S. House of Representatives, followed with an address on the "Relationship of Industry and Government." He mentioned the po-

sition of small business concerns in the post-war world, and summed up views on the small concerns by saying that: "Little business incorporated is the biggest business in America." He also talked about the burdensome large taxes due to the war, and stated that "We can look forward to a downward trend, rather than tax increases, for the remainder of the war. When tax reductions come, excess profits tax, in the case of corporations, must be eliminated."

Many other interesting papers were read during the four day session, excerpts from some of which follow:

Post-War Federal Highways

MAJ. GEN. PHILIP B. FLEMING, administrator, Federal Works Agency,

presented a paper entitled, "The Status of Public Works Planning." In this paper, he gave highlights of the new Federal-Aid Highway Act, which he felt were particularly significant. A Federal contribution of \$500,000,000 a year on a 50-50 Federal and State matching basis, for the first three post-war years is authorized. Gen. Fleming said that this is the largest Federal authorization for road building approved at one time in the history of the United States. The Act considers a 40,000 mile system of interstate highways, the development in each State of a system of principal secondary and feeder roads, greater recognition to the problems of urban traffic, and a more ambitious program of grade-crossing elimination. He also compared our roads with those in England, with ours having the better of the comparison.

HERMAN A. McDONALD, president, American Association of State Highway Officials, spoke briefly on the steps to be taken by the individual States now that the Federal-Aid Highway Act was law. First, he said, the States must enact whatever legislation is necessary to meet the requirements resulting from this legislation, and second, to work with all possible speed on preparation of plans so that the program will be ready to go ahead when the day for action arrives.

HON. J. W. ROBINSON of Utah, chairman, Committee on Roads, U. S. House of Representatives, read his paper called "The Groundwork Is Laid," in which he elaborated on the new Act. He said that the \$500,000,000

(Continued on page 123)



Chas. M. Upham, engineer-director, American Road Builder's Association, chatting with Maj. Gen. Fleming, Administrator, Federal Works Agency

ROCK PRODUCTS'
CONCRETE PRODUCTS
and Cement Products

**FEBRUARY
1945**



• American Pipe & Construction Co., Los Angeles, Calif., manufactured and installed 96-in. I.D., reinforced concrete pipe for circulating water tunnels, Harbor Steam Plant, City of Los Angeles.



STEARNS' Post-War Contribution

Every Concrete Products Manufacturer should read this message from Gene Olsen

A NEW REVOLUTIONARY METHOD OF BLOCK MANUFACTURE

ADAPTABLE TO JOLTCRETES

A GREAT NEW LINE OF BLOCK MACHINES

A MODEL FOR SMALL MARKETS

AVAILABLE FOR POST-WAR NEEDS

Be sure to make use of the mature experience of Stearns representatives. They will help you get the greatest possible production out of your present equipment.

"I am happy to tell you that Stearns research engineers have developed an amazing new method of manufacturing concrete building units.

"It is as basically revolutionary, as great an advance over anything heretofore used, as vibration was over tamping when Stearns Joltcretes were first introduced.

"This new method results in:

- sharply higher strengths
- much greater density
- greater uniformity
- a wider permissible range of moisture content
- a far better job with poorly graded aggregate.

"With this new process three vitally important things have been accomplished.

"1—Present Joltcretes will not be made obsolete—rather, they will be improved—because a conversion unit will be available to adapt the new process to these good Stearns machines.

"2—Stearns is bringing out a completely new line of fully automatic, high production block machines that are far superior to competitive equipment.

"3—For plants in smaller markets Stearns will have a new line of semi-automatic machines that embody the new process at a correspondingly lower investment.

"These machines will be available just as soon as pressure of war production and man-power shortage permit. You will be fully repaid by waiting.

"This is our post-war contribution to you—to your and our great future."

Gene Olsen

STEARNS
MANUFACTURING CO. - ADRIAN, MICH.
GENE OLSEN, PRESIDENT

STEARNS JOLTCRETES, CLIPPER STRIPPERS, MIXERS, SKIP LOADERS ARE AVAILABLE NOW

VIBROCAST Concrete Products



Fig. 1: Manufacturing 72 in. reinforced concrete sewer pipe, by the vibrocast process, near Chicago in 1928. The vibrator was rigidly attached to the form with a chain; portable power unit is shown in the foreground

On October 16, 1928, C. H. Bullen, president, Mid-West Concrete Pipe Co., Franklin Park, Ill., asked me to witness the demonstration of the vibrocast method of manufacturing reinforced concrete pipe. When the late M. I. McCarty, Ludington, Mich., visited me early in October, 1928, I suggested that he demonstrate his electric vibrator at some manufacturing plant, and arrangements were made with Mr. Bullen, who is one of the pioneers in the concrete pipe industry. A 24-in. concrete pipe, shell thickness of 3 in. was manufactured with concrete with a slump of about $\frac{1}{2}$ in. and Mr. Bullen and I were profoundly impressed with this demonstration. Subsequently this method of placing concrete, of plastic consistency, was generally adopted for the manufacture of reinforced concrete pipe ranging in diameters, from 12 to 108 in. by those using the cast process, and in 1936 for reinforced concrete pipe up to 152 in. in diameters and 12 ft. in length at Los Angeles, Calif.

Prior to 1928, most of the "hand cast" reinforced concrete pipe, as it was generally called, was made with concrete of a fluid consistency with

By M. W. LOVING*

Careful gradation of aggregates, rigid control of concrete consistencies, and determination of proper amplitude and duration of vibration are essential

a slump, from about 10 to 6 in. Cylinders made of the same concrete and cured with the pipe ranged in compressive strengths from 1500 to 2500 p.s.i. and with especially good aggregates up to 3000 p.s.i. at 28 days. The strengths of the pipe were correspondingly low. There were some manufacturers who placed concrete of drier consistency, using the joltcrete method, or by laborious hand spading. But in these cases it was very difficult to avoid honey-combing of the concrete which was then the rule rather than the exception. Because engineers demanded, and wanted smooth and even surfaces for concrete pipe and other products, they were content with low strength concrete and often rejected concrete products made with high strength

concretes because of surface and other defects.

The vibrocast method of placing concrete changed this and the engineer or other user was provided with concrete products made of high strength concrete that was dense and especially impermeable. Cylinders made of this concrete and cured with the products indicated compressive strengths up to 5000 p.s.i. and more, at 28 days (Fig. 1).

Correct Surface Texture

Some of those who used the vibrocast process for the manufacture of reinforced concrete pipe, reinforced concrete cribbing, reinforced concrete lighting standards and concrete products of all kinds said that some of the engineers and other users objected to the pock-marked surface texture caused by the accumulation of entrained air. Some attributed this to the kind of oil used in greasing forms and others blamed the aggregates. Our view was and is that these "air bubbles," as they are commonly termed, have no detrimental effect on the concrete, except from the standpoint of appearance or what may be termed sales resistance. Many of the producers of concrete products have practically eliminated this

*Consulting engineer.

LEADERS in the Concrete Products Industry

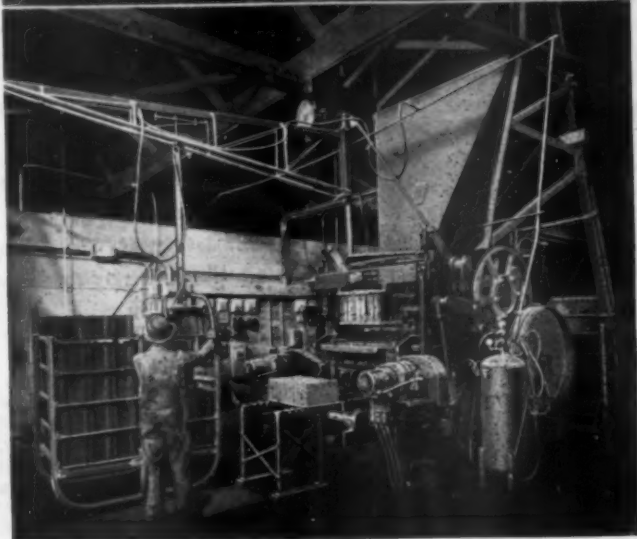


(L) Mr. J. C. Wright, (R) Mr.
G. R. Jessen, Partners, Utah
Concrete Pipe Company

The Utah Concrete Pipe Company, Salt Lake City, Utah, started manufacturing concrete masonry units in 1936 with a Besser Victory Tamper. This first Besser tamper is still in operation. Their first Vibrapac was installed in August, 1942, and their second Vibrapac in April, 1943. Their present production is 95% for war building construction.



This is the 36th of a series of advertisements featuring leaders in the concrete products industry who have installed Besser Vibrapacs to step up production of high quality concrete masonry units.



— using Besser Plain Pallet
VIBRAPACS
in War Production

KEEP YOUR
FIT A
FARM
ARE W

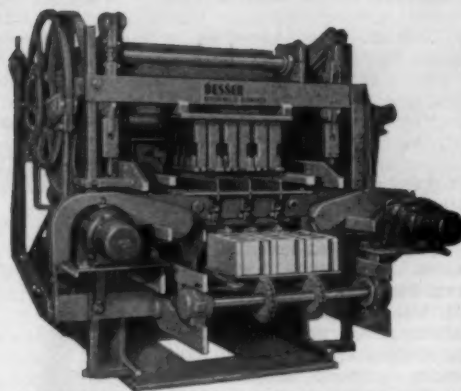
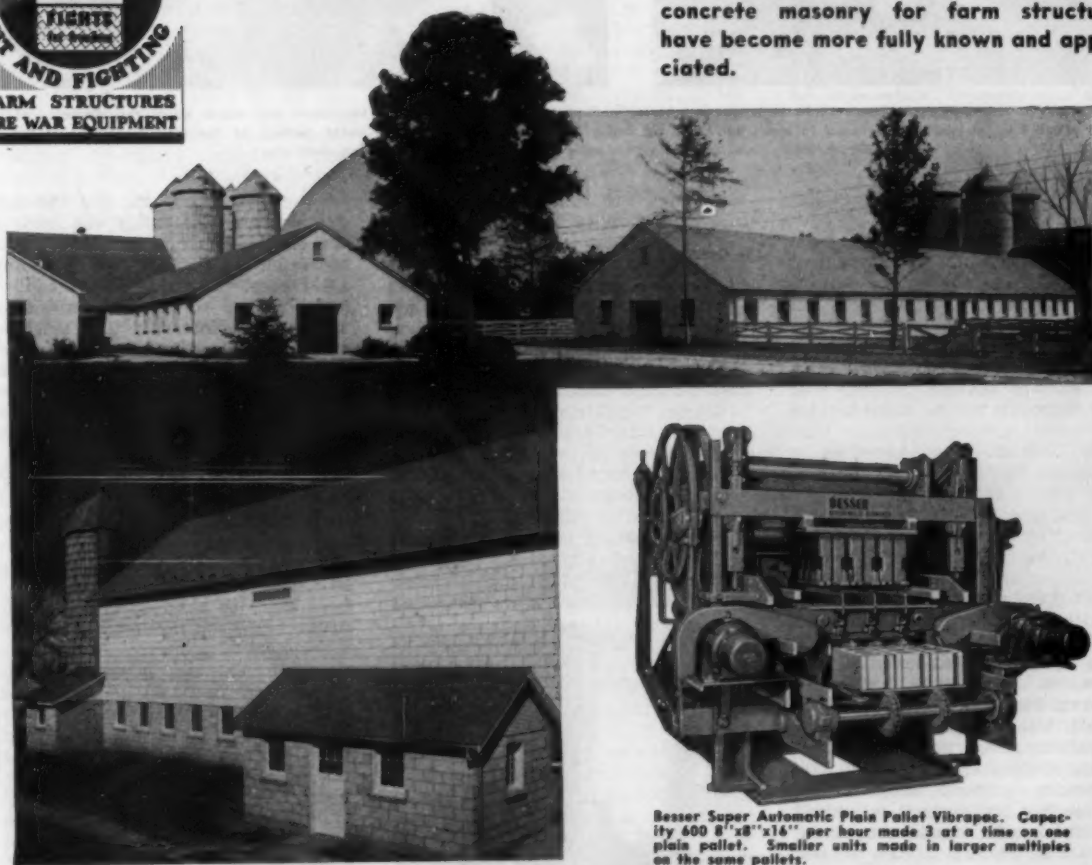
Why
fires
"rep

ESS
BRA

Concrete Masonry Units Plentiful for Farm Structures



During the past three seasons farm building construction has provided a big market for many concrete masonry manufacturers. This market will grow faster now that the availability and advantages of concrete masonry for farm structures have become more fully known and appreciated.



Besser Super Automatic Plain Pallet Vibrator. Capacity 600 8"x8"x16" per hour made 3 at a time on one plain pallet. Smaller units made in larger multiples on the same pallets.

Why concrete masonry units are Better for all Farm Buildings—use not restricted—low cost—firesafe—permanent-weatherproof—better sanitation—rodent and vermin proof—freedom from "repairs."



Important Patent Notice
Licensed under the Colburn basic vibration patents.
Unidirectional vibration licensed under Flann patents.
The Vibrapac combines vibration with exclusive patented Besser Plain Pallet principle.

BESSER MANUFACTURING CO.
202 Forty-Fifth St. • Alpena, Mich.
Complete Equipment for Concrete Products Plants
THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER



Fig. 3, left: Rotating drill rods, about 14 ft. in length and $\frac{3}{8}$ in. in diameter, with an offset at the lower end about equal the diameter of the rod and about 6 in. in length, were used to expel entrained air and provide a smooth inner and outer surface of the pipe mentioned in Fig. 2.

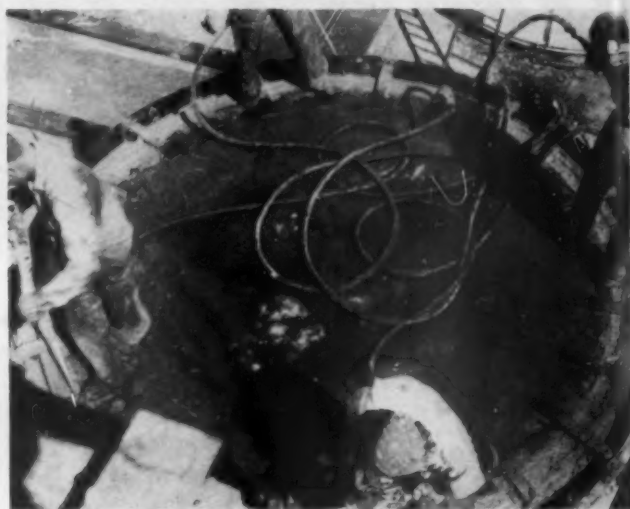


Fig. 4, right: Four men with pneumatic drill rods were employed on each pipe

trouble by careful gradation of aggregates and rigid control of concrete consistencies. The vibrocast method, like any other process, used in the manufacture of concrete products has to be carefully worked out from day to day and the best results are obtained by practical experience—that is, the cut and try method.

The surface texture problem was finally overcome in the manufacture of reinforced concrete pressure pipe for the Colorado River Aqueduct in Los Angeles in 1936, by a combination of vibration, Fig. 2, and by the use of rotary drill rods provided with an offset at the lower end which propel them through the concrete mass. These drill rods were rotated at about 700 r.p.m. and provided the pipe with a smooth inner and outer surface and are shown in Figs. 3 and 4. This equipment was invented and patented by J. E. Miller, president, Lewistown Pipe Co., Chicago, Ill., in 1935. Mr. Miller, and others of wide practical experience, used this method for consolidating concrete of plastic consistencies without supplemental vibration. But obviously it is limited to concretes with initial slumps up to about 2 in. These drill rods worked the concrete under and around the steel reinforcement assembly expelling entrained air and water pockets that might accumulate under circumferential steel members, thus enhancing the bond of concrete to the steel reinforcement.

Dense, Impermeable Concrete of High Strength is the end result of the vibrocast process; thus, the products made with concrete placed this way have a long life expectancy. It must be understood that we are not advocating the vibrocast method of concrete placement as the only or necessarily the best method of manu-

facturing concrete products. The machine tamped, centrifugal and packer-head processes are equally as good. In subsequent articles in *Rock Products* we will discuss each process separately and the reader will then see that all processes are good; when and if concrete products of inferior quality are made, it is because the manufacturer and not the process is to blame. We intend to say what has been and can be done with the several methods of producing concrete products of excellent quality.

C. M. HOWARD¹ supervised the manufacture of 48-in. diameter reinforced concrete pipe in 8-ft. lengths made by the vibrocast process in Seattle in 1936. The shell thickness

of the pipe was 5 in. and the steel reinforcement assembly was made as an ellipse by spiral winding $\frac{3}{8}$ -in. steel on a mandrel. Longitudinal steel rods, on about 12-in. centers, were welded to the circumferential members at intervals. The steel assembly was held in accurate position during manufacturing operations by metal spacers welded to the steel members, at intervals, which in turn rested against inner and outer forms.

The concrete used in the first pipe manufactured had a slump of about 2 in. When the pipe was subsequently tested, by the 3-edge method, the strength of the pipe at the lower end was greater than at the top. This condition was corrected by using a concrete with a slump of about 2 in. at the bottom of the form and gradually diminishing the mixing water so that the concrete placed in the top of the form had no slump. The reason for this was that the water gradually rose through the concrete mass during vibration and liquefied the concrete at the upper end of the form. Fig. 5 shows the form with the vibrator rigidly attached thereto; the form rests on a wooden platform, which in turn, is supported by strips of rubber.

While we could discuss the many aspects of the vibrocast method of manufacturing concrete products, based on American practice, we feel that the readers of *Rock Products* would be interested in English experience, which corresponds to that in the United States. The following is taken from the writings of H. L. Childe²:

¹Engineer, Concrete Pipe and Products Association, Seattle, Washington.

²Concrete Products and Cast Stone, 1940, 14 Dartmouth St., London, S. W. 1.



Fig. 2: The vibrators were rigidly attached to the form ribs by a vise and raised as the concrete was placed in the form of this 123 in. diameter, 12 ft. length reinforced concrete pressure pipe at Los Angeles, Calif., in 1936

"Vibratory methods of consolidation are generally achieved by the use of electric or pneumatic machines imparting shocks to the moulds at the rate of 3000 or more per minute. Vibration is an almost indispensable method of consolidating certain types of concrete products, but it is no remedy for inferior materials or workmanship. It will not make good concrete from poor quality, badly graded, or unevenly mixed materials. It will give a product with a smooth and hard surface in spite of the inferior mixture, but this will be skin-deep only.

Effects of Vibration

"In addition to the measures necessary for the production of good concrete with other methods of compaction, vibration introduces other factors which must be considered. The grading may have to be altered, water content may have to be reduced, and a leaner mix may give equal strength to richer mixes consolidated by hand tamping. The amplitude (that is, the greatest displacement of the moving part of the vibrator from its position when at rest), the number of vibrations per minute and the duration of vibration all affect the concrete in different ways, and the effects differ with the water content and the grading of the mix. For example, if agitation be applied to a fluid mix it will quickly cause the heavier particles to sink to the bottom of the mould, whereas the same vibration might have no effect at all in altering the relative positions of stones of different size in a stiff mix. If vibration is not properly controlled it can nullify all

the care taken in grading and mixing the materials.

"Another effect of vibration is to bring a skin of rich mortar against the sides of the mould. The thickness of this layer depends upon the consistency of the mix and the kind and duration of the vibration, and the thicker the layer the more the rest of the concrete is robbed of cement and fine material. With fluid mixes a light-colored smooth surface is easily obtained, but the quality of concrete cannot be judged by its outward appearance. Vibrated concrete, for example, may have entirely different proportions of materials in its core and face if the agitation is allowed to bring an excess of mortar to the surface. A column or pipe made on end may, due to prolonged and unsuitable vibration, comprise a lean, coarse mix at the bottom and a rich mix containing fine aggregate only and an excess of water in the upper portion.



Fig. 7: Closeup of one of the pipe shown in Fig. 6, all of which had a smooth interior and exterior surface; the result of careful gradation of aggregates, thoroughly mixed concrete and controlled vibration



Fig. 6: Six 48 in., 8-ft. reinforced concrete pipe manufactured by the vibrocass process at Seattle in 1936

Consistency

"Vibration can be used as a means of quickly getting the air out of a fluid or plastic mix and bringing a skin of cement to the mould faces, or of economically consolidating a stiff mix to produce a very strong concrete.

"If dense and strong concrete is the primary consideration very stiff mixes can and should be used. The quantity of water depends upon the size and grading of the aggregate, and the most suitable quantity must be ascertained in each case. The primary reason for the extra strength of vibrated concrete is that vibration permits concrete with a low water content to be consolidated properly. At the Building Research Station it has been found that, using a vibrating table, a water-cement ratio of between 0.375 and 0.425 gave the best results at all frequencies between

1500 and 8000 vibrations per minute. Compared with the water content which gave highest strengths, an increase of 0.05 in the water-cement ratio reduced the strength by about 15 per cent. A reduction of 0.05 in the water-cement ratio, however, reduced the strength by no less than 25 per cent. Further variations in the water-cement ratio gave even more striking results. For example, an increase of 0.1 in the water-cement ratio reduced the strength by about 30 percent, while a reduction of 0.1 in the water-cement ratio reduced the strength by about 80 per cent (from 6300 p.s.i. to 1300 p.s.i. with a frequency of 8000 vibrations per minute). The reason is that the amount of water which gives highest strength is only just sufficient properly to hydrate the cement and enable the hardening process to take place.

(Continued on page 117)

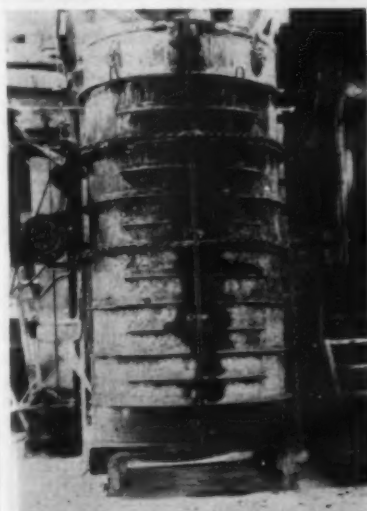


Fig. 5: This 8-ft. form was used at Seattle, Wash., in 1936 to manufacture 48-in. reinforced concrete pipe. Vibrator was rigidly attached to the form, about two-thirds up, and the form rests on a wooden platform supported by rubber strips



Granules of expanded vermiculite



Flake of vermiculite ore



Some flake of vermiculite ore after heat treatment and expansion

VERMICULITE Insulating Concrete

Lightweight concrete of vermiculite aggregate has many industrial applications in precast shapes and as poured on the job concrete

Written Under the Direction of
H. K. LANGE*

In the five years since vermiculite insulating concrete has been developed, it has been found to be an efficient material for a growing range of uses. One of its expanding fields is farm service buildings, where in cavity wall construction and as an insulated floor it has solved the farmer's long-standing problem of indoor condensation. Vermiculite concrete has sufficient strength for structural floor and roof construction, and because of its light weight does not place undue strain on framing members.

Its value as fire-proof roofing has been recognized by the War Department. The new Pentagon building in Washington, D. C., and many war plants throughout the country are roofed with vermiculite concrete for protection against incendiary bombs. It meets the demands of cold storage insulation, because it is odorless, rot-proof and chemically inert. As an underground pipe covering for steam and hot or cold water lines, it keeps pipes dry, and helps to prevent corrosion; and it is particularly adaptable to wet soil conditions. It can be fabricated into precast block or tile as refractory concrete for furnace walls, for acoustical correction, for sound-proofing and for fire-proofing. In these applications, vermiculite insulating concrete will be an important material in the post-war construction program.

Origin and Character of Vermiculite

Vermiculite concrete owes its insulating properties to the characteristics of the mineral vermiculite, which is a member of the mica group of minerals. It is generally agreed that vermiculite is an alteration product of biotite mica, but geologists differ as to how the alteration took place. Some say that vermiculite was formed by surface weathering of biotite. Others believe that it was formed at depth by the action of heated waters. Biotite at some stage in the development is essential to the formation of vermiculite de-

posits; and heated waters, usually of relatively high temperature, are necessary for the formation of high grade deposits. Vermiculite is associated with rock types which contain relatively large amounts of amphibole and pyroxene. Geologically, vermiculite is very old. It is usually associated with rocks of pre-Cambrian age.

Like mica, vermiculite is laminated in structure, but it contains microscopic amounts of water between its layers. When the mineral is suddenly exposed to high temperatures in a calcining furnace, this water expands and explodes the flakes into cellular granules about fifteen times their original size. In this exploding process, countless numbers of tiny dead air cells are trapped between the layers. It is largely from these that vermiculite obtains its insulation value, although some additional insulation value comes from the smooth, bright surfaces of the individual laminae which reflect radiant heat in the same way that a mirror reflects light. These combined properties enable vermiculite to insulate efficiently at all temperatures from sub-zero to 2000 deg. F. The thermal conductivity of loose granules is 0.29 B.t.u. It is fireproof, not merely fire-resistant. It takes 2500 deg. F. to fuse vermiculite. It is a light-weight mineral. Its specific gravity is 2.53 before expansion. A cubic foot of expanded vermiculite weighs as little as 5 lbs., it has 12 times the insulation value of sand.

Vermiculite is not uncommon in its occurrence, but there are relatively few deposits of commercial size in the United States. Large bodies are known to exist in Mexico, Africa and Russia. The largest commercial deposit in this country is at Libby, Mont., about 150 miles north of Spokane, Wash. Smaller ore bodies have been found and worked in Wyoming, Colorado and North Carolina.

The Libby deposit, which is of un-

*Sales promotion manager, Western Mineral Products Co., Minneapolis, Minn.

usual
crop
is mi
ore in
from
mill
Recov
from
ciated
cause
specif
Prior
used
inter
ess in
air se

Mix

Ver
ordin
ules
aggre
or sto
acts
proof
water

Due
larger
given
than
range
that
gate
since
be w
is cor
water
gate
the a
ratio
requir
dition
quires
aggre
ing co
concr
A def
in me
is to
water
land
mixed
proof
added
final
added
lite a
distrib
throu

Text

Bo
vermi
color
ance
can b
deper
the m
aggre
excee
which
possib

usual purity, occurs as a surface outcrop at the top of a mountain, and is mined with a steam shovel. The ore is trucked to bins, and taken from them on a conveyor belt to the mill, a short distance down the hill. Recovering the smaller sizes of ore from the rock with which it is associated is a considerable problem, because the rock has almost the same specific gravity as the mineral itself. Prior to June, 1944, suction rolls were used for this purpose, but now an interesting and unique recovery process involves the use of compressed air separators.

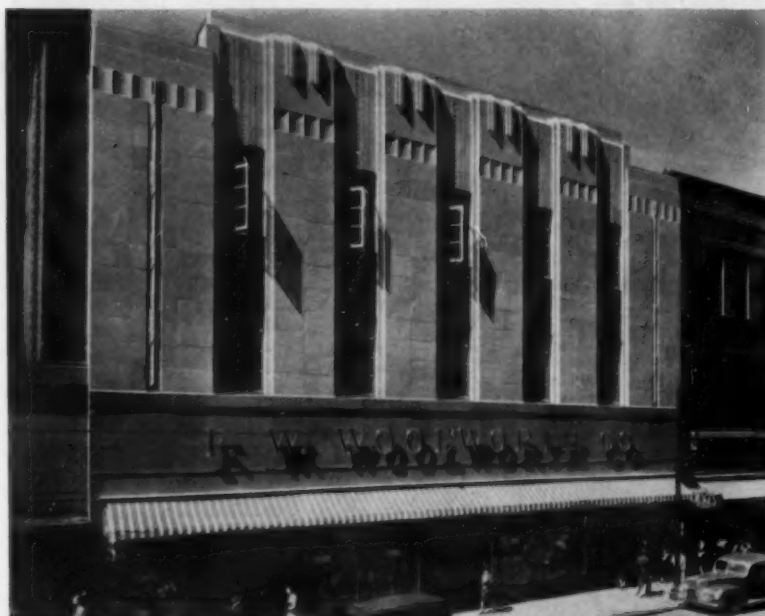
Mixing Vermiculite Concrete for Best Results

Vermiculite concrete is mixed like ordinary concrete, except that granules of vermiculite are used as an aggregate in place of sand, gravel, or stone. An emulsified asphalt, which acts as a binding, bulking and waterproofing agent, is added to make water-repellent concrete.

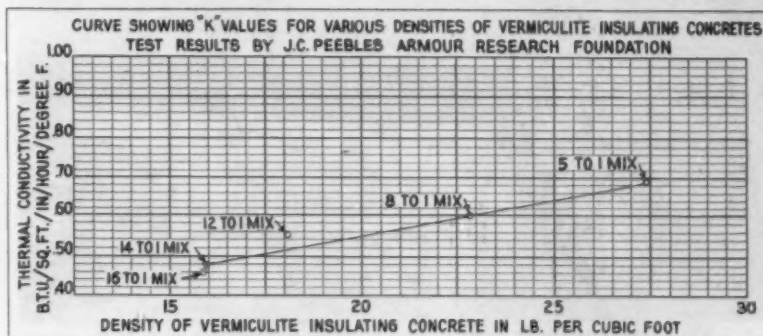
Due to the fact that there are larger proportions of aggregate in a given volume of vermiculite concrete than in ordinary concrete, the wider range of mixes used, and the fact that vermiculite is a porous aggregate that requires more mixing water since it presents a greater area to be wetted than solid aggregates, it is considered convenient to base the water ratio on the quantity of aggregate used in a mix rather than on the amount of cement. The water ratio depends upon the workability required to meet the specific job conditions. Plain vermiculite concrete requires 4 gal. of water per cu. ft. of aggregate to develop a mix of pouring consistency, and water repellent concrete requires a lower water ratio. A definite sequence is recommended in mechanical mixing. The first step is to introduce the proper amount of water into the mixer. Next, the portland cement is added and thoroughly mixed with the water. If any waterproofing agent is to be used it is then added and given a thorough mix. The final step, whether waterproofing is added or not, is to add the vermiculite and mix it only long enough to distribute the moisture uniformly throughout its mass.

Texture and Porosity Depends on Mix and Finish

Both plain and water-repellent vermiculite concrete are light gray in color and have the general appearance of ordinary concrete. The texture can be made fairly porous or smooth, depending upon the proportions of the mix and the type of finish. The aggregate particles usually do not exceed $\frac{1}{8}$ in. in size. The porosity which the aggregate produces makes possible the formation of a concrete



Over 12,000 sq. ft. of 3-in. vermiculite concrete slab were installed in this Louisville, Ky., store



Precast vermiculite concrete partition tile before and after plastering



Floating vermiculite insulating concrete over the metal deck of a pitched roof on the West Coast



Close-up of a roof-deck insulation of insulating concrete



Plant operation at the Zencolite mine, Mount Zencolite, Libby, Mont.

which weighs as little as 16 lb. per cu. ft. Ordinary concrete weighs about 145 to 150 lb. per cu. ft.; and cinders, slag, and burned clay aggregates produce concretes weighing from 75 to 95 lb. per cu. ft.

The strength and weight of vermiculite concrete vary with the proportions of cement used in the mix. For insulating roof fill, floor fill and structural roof deck, densities of 20 to 40 lb. per cu. ft. and compressive strengths of 50 to 250 p.s.i. produce the required result. About 31 cu. ft. of vermiculite concrete aggregate mixed with the proper proportions of portland cement and water will produce one cubic yard (27 cu. ft.) of placed concrete. When emulsified asphalt is used, only 27 cu. ft. of vermiculite concrete aggregate is needed.

Applications

Vermiculite concrete can be used in many types of construction with appreciable savings in weight and with increased insulation value. One inch of vermiculite concrete (density 25 lb. per cu. ft.) is equivalent in insulation value to 18 in. of ordinary concrete. Vermiculite concrete resists weathering. Freezing and thawing tests completed through 440 cycles have failed to cause it to rupture or disintegrate. Since it is an inert material, moisture or continued wetting does not cause it to react chemically and dissolve or break down. It is resilient, and takes up standard temperature stresses and strains within its own mass, without cracking, buckling or forcing out parapet walls.

Its high thermal resistance, lightness and permanence make it a good roof insulation and fill. It is easily formed into cants, saddles, and slopes to give proper roof drainage and a monolithic covering of insulation. The thermal conductivities of the vermiculite concrete mixes ordinarily used for insulating roof fill vary between 0.60 and 0.80 B.t.u. Vermiculite concrete forms a permanent, rigid base for roofing materials. It does not dent easily, and is not subject to disintegration or decay resulting from wetting, freezing or thawing.

The compressive strength of vermiculite concrete can be made to meet the particular requirements of a job, by varying the cement ratio in the mix. The greater the proportion of cement used, the greater the strength and density of the formed concrete, but, also, the smaller will be its insulation value. The most commonly used mix for insulating roof fill is composed of eight parts vermiculite aggregate and one part portland cement, producing a concrete weighing approximately 22 lb. per cu. ft., with a thermal conductivity of about 0.60, and a compressive strength of 70 p.s.i.

(Continued on page 119)

Vibration

(Continued from page 113)

"One of the effects of vibration is greater density. It is a simple matter to check the density of vibrated and unvibrated concrete by weighing samples made in similar moulds; the heavier the sample the greater its density. Different gradings, water contents, frequencies, amplitudes, and times of vibration should be used until maximum density is obtained and these can then be standardized so long as the same materials and consistency are used. A frequency of 3000 to 6000 vibrations a minute is generally used with electric and pneumatic vibrators.

"The test pieces should also be broken to see if any separation of materials has taken place, and the vibration varied until separation is a minimum. If vibration produces heavier concrete than can be made economically by other processes, and providing there is no separation, a better concrete is being made. It is then open to the manufacturer to reduce the proportion of cement used, or to reduce the size of the product, if the extra strength is not required. Generally the saving will be made by using leaner mixes, due to sizes of many products being controlled by standard specifications.

Extra Materials Required

"If the vibration is effective more material will be required to produce a cubic foot of concrete due to the better compaction obtained compared with hand tamping. This may vary from 5 to 10 percent according to the grading of the mix, the water content, and the nature and duration of the vibration, and will be different for different mixes. The cost of extra materials and of the vibrators and power consumption must be balanced against the labor saved compared with hand-tamping, the earlier release of moulds, the smaller cement content that may be possible due to the stronger concrete produced, and the reduced cost of finishing.

"The extra volume of mixed material required for a given volume of finished concrete will be greater in the case of stiff mixes than if they are fluid. A mould filled with stiff concrete may be only three-quarters full after vibration, whereas the volume of a fluid mix will be very little less following vibration. This is due to two causes. One is that the stiff mix contains a considerable proportion of voids which are filled by the action of the vibrator, whereas the extra water in the wet mix acts as a lubricant and enables the voids to be filled as the concrete is poured into the mould. The other reason is that in the case of a fluid mix a greater proportion of the contents of the mould is water, the volume of which is unaffected by vibration.

"The tests at the Building Research Station already referred to showed

little difference in strength with different frequencies. For instance, with a water-cement ratio of about 0.42 a frequency of 8000 vibrations a minute gave a strength of 6300 p.s.i., whereas a frequency of only 1500 vibrations a minute gave about 6000 p.s.i. The difference of 5 percent is within the limits of accuracy that may be expected in tests of this nature, and suggests that, in practice, using the proportion of water which gives maximum strength, the results are the same whether the frequency be 8000 or 1500 vibrations a minute.

"Vibration at all the frequencies used in the tests increased the strength by 40 percent or so com-

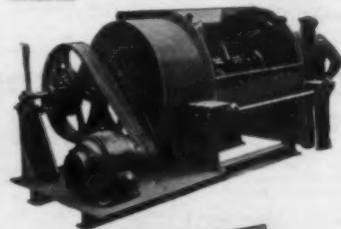
pared with test cubes compacted by the standard method of hand ramming. Comparing carefully controlled vibration with carefully controlled hand ramming, an extra 7 percent of material gave 40 percent greater strength due to the increased density and the lower water content of the vibrated specimens.

"The nature and thickness of the mould also influence the effect of the vibration on the concrete. The thicker the mould and the softer the material of which it is made the more it will absorb the shocks before they reach the concrete. For example, a thin steel mould will offer less resistance to the transmission



MULTIPLEX STANDARD TAMPER

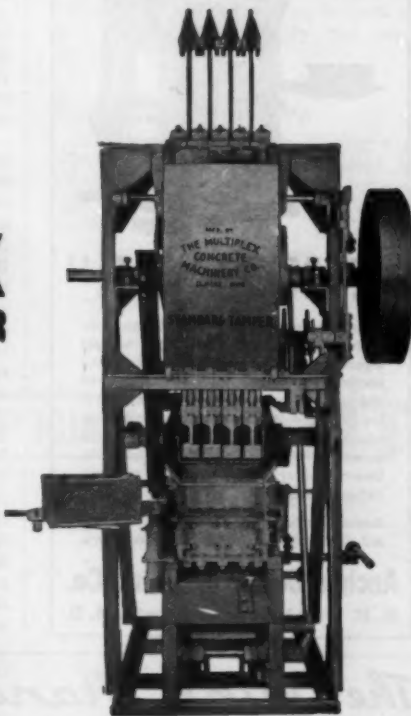
• Your reputation as a concrete block manufacturer is wrapped up in every block you turn out. And the best guarantee to building a lasting reputation is the assurance that your own facilities will turn out block of a uniformly high quality. The Multiplex 8-bar Standard Tamper has already helped many manufacturers build a strong reputation. It produces from three to four 8 x 8 x 16 in. units a minute. It can be used for making both plain and stripper, or face blocks, on one base. Time feeding while tamping and hopper agitation account for better units. The strike-off hopper assures a smooth top. The Multiplex Standard Tamper has a rugged, all-steel welded frame and reinforced moldbox.



THE MULTIPLEX COMBINATION

- Beauty in Block
- Low Cost Production
- Simple Operation

FOR BLOCK THAT BUILDS A LASTING REPUTATION



A BETTER MIX AT LOWER COST

Multiplex Multi-Mixer with reverse screw-type action insures fast and thorough mixing of every batch. This is the machine for an "assembly line" uniform product at all times.

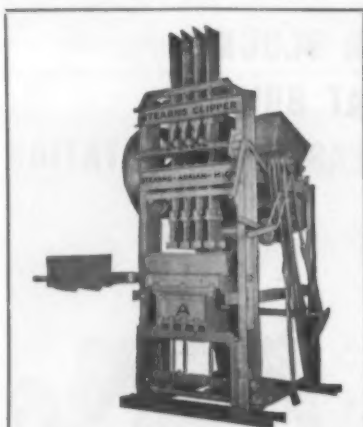
Write today for booklet describing our complete line of equipment and vibrating machines.

MULTIPLEX CONCRETE MACHINERY

ELMORE, OHIO

of the shocks than a mould made of thick wood.

"Another factor which affects the vibration is the rigidity of the mould. A loosely-made mould will allow a considerable proportion of the vibration to be wasted at the joints. The ideal mould is one which has a maximum rigidity and which itself absorbs a minimum of the vibration. It is also preferable to clamp the mould to the top of the table to eliminate the possibility of the mould bouncing when the vibrator is started. These factors are well known to the makers of vibrating plant and have been considered in the design of the tables sold by reputable firms.



"ANCHOR"

Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service. Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns rollers, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mch. Co.

G. M. Friel, Mgr.

Columbus 8, O.

Early Release of Molds

"The possibility of the early release of moulds from vibrated concrete products is important. As soon as the vibration is completed the concrete becomes a stiff jelly-like mass; it is difficult to make an impression in it with the thumb and, if an impression is so formed, as soon as the pressure is removed the cavity fills in due to the elastic and gelatinous nature of the mass. By taking advantage of this property of vibrated concrete the moulds can be released immediately.

Vibrators Attached to or Held Against Molds

"Due to the shape or size of the moulds it is not always possible to use a vibrating table. In such cases the vibrators may be attached to the moulds. Most of the points to be considered in connection with table vibration apply to the direct attachment of the vibrators. With unsuitable mixes or vibration there will be the same tendency for materials to separate. The moulds must be strong and rigid and the vibrator must be firmly clamped to the mould. Special clamps are available for fixing the machines to the moulds, and these should be used.

"Whereas a table will vibrate the whole of the underside of the casting with more or less the same force, when the machine is attached to a mould its effect will be much less uniform. The vibration will be at a maximum at the point where the machine is fixed, and in the case of a large casting there may be parts distant from the vibrator where its influence is hardly felt. In such cases it is necessary to use more than one machine, or to move the machine as the mould is filled. The practice of fixing one or more vibrators near the bottom of the mould and leaving them in the same position while the mould is filled is to be avoided if the filling operation is a lengthy one. If this is done the concrete first placed will be subjected to a longer period of violent shaking while the concrete placed later will be agitated to a smaller degree for a shorter period.

The result will be a serious absence of uniformity in the casting.

"Another point to be guarded against is the formation of layers of rich mortar between the layers of concrete. Except when a very dry mix is used, too much vibration will cause the heavy aggregate to sink and the fine material and water to rise. This will happen as each batch of concrete is placed in the mould, and the result will be a product comprising layers of rich mortar sandwiched between layers of concrete which may be deficient in cement. In other words the vibration will have unmixed the materials.

"So far as present experience goes, the requirements for satisfactory vibration are:

- "(1) Strong and rigid moulds.
 - "(2) A firm connection of the vibrator to the mould, or clamping of the mould to the shaking table if one is used.
 - "(3) A stiff concrete mix. This is of the utmost importance if the best results are to be obtained.
 - "(4) No more vibration after water is seen to come to the top.
 - "(5) Grading and proportioning such that the stiff mix will be properly consolidated when water first rises to the top.
 - "(6) A frequency which coincides with that of the mould and its contents, so as to avoid any tendency for the mould to bounce on the table, or, in the case of vibrators attached to moulds, a frequency which coincides with the frequency of the shutters.
 - "(7) An amplitude that will consolidate the mix without separation.
 - "(8) An equal amount of vibration for the whole of the concrete.
- "If the vibrators are used for a constant production of one type of product it should not be difficult to conform to all these requirements."

Ready Mix and Asphalt

TRANSIT MIXED CO., Pasadena, Calif., plans to open an asphalt mix plant at Corona, Calif., according to an announcement by Don Bourne. The company owns sand and gravel deposits located at Corona.

The "Quinn Standard"

FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 30 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY

Complete information, prices and estimates sent on request. Also manufacturers of Quinn Concrete Pipe Machines.

QUINN WIRE & IRON WORKS 1803 1/2 ST. BOONE, IA.

YOU SPECIFY-WE FURNISH Better Johnston Steel Racks and Pallets



... are built on order to suit your needs. They are the most economical and efficient that can be made for your plant requirements. Johnston racks and pallets are already giving complete satisfaction in numerous plants. Let us handle your requirements.

**JOHNSTON
IRON WORKS**
1123 Cassella Ave.
Chicago 13, Illinois

Vermiculite Concrete

(Continued from page 116)

In structural roof decks, vermiculite concrete weighs only 30 to 35 lb. per cu. ft., compared to about 150 lb. per cu. ft. for ordinary concrete. This reduction in dead load may be reflected in structural steel savings and lessening of settlement problems. Vermiculite concrete can form the roof deck and provide permanent insulation at the same time, so that no additional insulation is required on top of the deck. It has good sound absorbing efficiency. When the underside of vermiculite concrete in a roof deck is exposed, it reduces the noise level and reverberation in the space below so that excellent acoustical treatment can be obtained at no extra cost.

Roof Construction

A growing field for vermiculite insulating concrete is in Bermuda type roof construction. Bermuda roofs can be placed over new or existing roofs. They are designed to resemble the coral slabs used for roofs in the Bermuda Islands. The vermiculite concrete is poured monolithically over the prepared roof deck. It can be varied in design and texture to harmonize with almost any architectural style. By means of scoring, texturing, and painting, the concrete can be made to look like wood shingles, slate,

thatch, coral slabs, or various types of tile. Aside from their decorative features, vermiculite concrete Bermuda type roofs offer the advantages of insulation, fireproofing and permanence. The concrete in Bermuda type roofs is usually placed so as to have an average thickness of from two to three inches. This insulates the building where it is most needed, which is in the roof. It eliminates fire hazards originating from the outside. Tests have showed that a 3-in. slab had such resistance to the passage of heat that after being exposed to a flame temperature of 1832 deg. F. for several hours, the cold side of the slab registered only 347 deg. F. It is practically impossible, even for the heat of a blow-torch, to penetrate through a vermiculite concrete Bermuda roof slab so that inflammable materials underneath would become ignited.

Uses on the Farms

The farm building rehabilitation program sponsored by the U. S. Department of Agriculture, agricultural colleges and engineers, and the farm press has widened the field for vermiculite insulating concrete. Its use here is for insulated floors and in cavity walls. It is also used as a lightweight covering over existing hay-mow floors, where old barns are remodeled for other service. Vermiculite concrete floors can be laid over new

or existing floors. For a new floor, a gravel fill from 6 to 8 in. deep is first laid. Over this goes water-proof paper. Poultry house floors have 2 in. of ordinary concrete over the water-proof paper, and then 2 in. of vermiculite concrete. A "skin" coat of cement lightly sprinkled over the top and troweled in makes a smooth finish. For hog houses and dairy barns, where the animals are heavier, from 4 to 6 in. of vermiculite concrete is placed over the tamped fill, and finished with a 1½-in. topping of ordinary concrete for a wearing surface. An existing floor is simply covered with waterproof paper, over which the vermiculite concrete is placed. Vermiculite concrete in cavity tile walls is becoming popular with the farmer because it gives him a warm, dry building that is fireproof and permanent. It has the additional advantage at present of being non-critical and available. For cavity wall construction, where the 2-in. or 2½-in. void is poured with vermiculite concrete, the usual mix is 16 parts of vermiculite aggregate to one part portland cement.

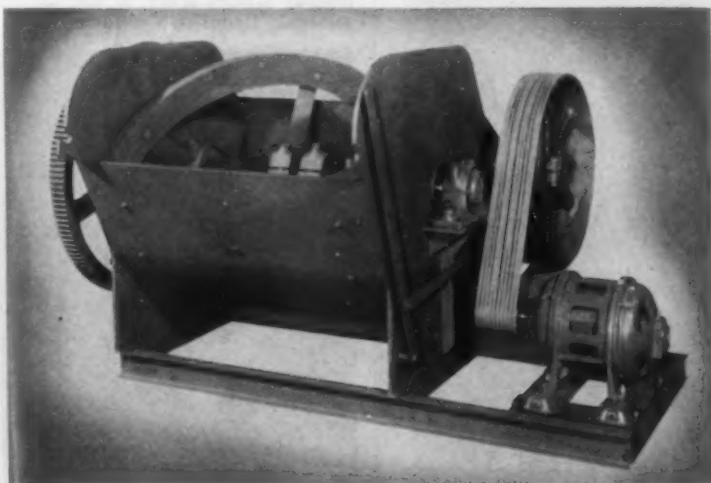
(L.A.C.)

Sell Block Concern

McCook CEMENT AND BLOCK CO., McCook, Nebr., has been sold to Oliver Benzing who plans to expand the business and also sell ready mixed concrete.

... In Your MODERN Post-War Products Plant

LET US HELP YOU GET STREAMLINED EFFICIENCY KENT



● Kent Machinery has helped the Concrete Products industry become one of the major construction materials industries. Let us help you gear your

plant to meet the tremendous post-war demand for concrete products.

Vibra-Press Block Machines

Strippers and Tampers

Concrete Feeders

Concrete Elevators

Mixers

(Continuous and Batch)

Aggregate Elevators

Aggregate Feeders

Pallet Cleaners and Oilers

Pallets

← the KENT BATCH MIXER

THE KENT MACHINE CO., 133 Portage Trail, CUYAHOGA FALLS, OHIO

OKLAHOMA MINERALS INDUSTRY CONFERENCE

Conference points to need for
more liming materials on the land

THE FIFTH ANNUAL Oklahoma Mineral Industries Conference, held December 5, 1944, in Oklahoma City, Okla., drew an attendance of 90 persons including several visitors from neighboring Missouri.

The purpose of the meeting can best be expressed by quoting from the program: "The purpose of the Oklahoma Mineral Industries Con-

ference is to bring together members of the various mineral industries in Oklahoma for the exchange of interests, problems, and ideas, and to establish better contact between the Oklahoma Geological Survey and the people it is maintained to serve, and thus direct the activities of the Geological Survey into the most fruitful channels. The ultimate objective is

to promote new and increased utilization of our mineral resources."

The morning session was opened by the president, HOMER DUNLAP, Jr., of the St. Clair Lime Co., who welcomed the members and guests. The first speaker was WILLIAM E. HAM, geologist with the Oklahoma Geological Survey who spoke on "Oklahoma Raw Materials for the Glass Industry." Material for his talk was obtained from his field work during the year which concerned glass sand formations in Oklahoma.

L. W. OSBORN, manager of the Osborn Agricultural Service of Muskogee, Okla., then spoke on "Limestone and Agriculture." His talk concerned the increasing importance of agricultural limestone in Oklahoma in recent years. He gave figures showing that approximately 325,000 tons of agricultural limestone would be spread on Oklahoma farm lands in 1944. This is a startling increase over 1943 when only 55,900 tons were spread. Mr. Osborn painted a bright future for the industry in the years to come and said that the State had an abundant supply of raw material located close to the consuming areas.

The next speaker, DR. ROBERT H. DOTT, director of the Oklahoma Geological Survey, read his paper on "Oklahoma Geological Survey Work on Minerals and Ground Water." In this paper he gave a resumé of the Survey's activities in solving problems concerning ground water, future development of available minerals, the future of agricultural limestone, studies on oil and gas, and laboratory research on mineral utilization. He elaborated on the field work and geological mapping done during the past year as well as laboratory studies made of the various minerals found in Oklahoma.

Here's an example of what

**"ORO SUPERMANG"
"QUAD-EDGE"**

**REVERSIBLE AND RENEWABLE
TIP HAMMERS CAN DO FOR YOU!**



The hammers shown here are typical of the savings you can make with "Quad-Edge" Four Corner Reversible and Renewable Tip Hammers. In addition to improved design, the ORO Supermang manganese steel used gives the parts longer-lasting wearing service. Write for Bulletin 451 which describes all the advantages of using "Quad-Edge."

"Quad-Edge"—a 20-lb. Hammer with 7-lb. "Quad-Edge" Reversible Four Corner Tips. When replacements are necessary, you buy a 7-lb. tip which because of its reversible features gives the approximate service of two 20-lb. Hammers.

Use ORO Supermang Repairs for Crushers, Pulverizers, Shovels, Cranes, Draglines, Feeders and Chains. Write today for literature of ORO Super-Service Repair Parts.



"Conventional" hammers. Two of these are needed to do the work of one "Quad-Edge" because of the latter's reversible features. Customers report that "Quad-Edge" Tips cost them about one-half of previous welding costs.

KENSINGTON STEEL CO.
507 KENSINGTON AVE. CHICAGO 28, ILL.



Homer Dunlap, president, Oklahoma Mineral Industries Conference

CE

utili-
s."
pened
P, JR.,
wel-
t. The
HAM,
ologi-
homa
ndus-
s ob-
the
d for-

ne Os-
lusko-
estone
cerned
agri-
ma in
show-
0 tons
uld be
nds in
se over
were
bright
years
te had
aterial
areas.
ERT H.
a Geo-
oper on
Work
er." In
f the
prober-
er, fu-
e min-
l lime-
s, and
al utili-
e field
g done
as lab-
various

Mineral



L. W. Osborn, manager, Osborn Agricultural Service

Closing the morning session was a speech by DON McBRIDE of the Oklahoma Planning and Resources Board who spoke on "Selling Oklahoma."

C. E. CREAGER of Muskogee acted as toastmaster at the noon session following the dinner. He introduced President GEORGE L. CROSS, of the University of Oklahoma, who made a few appropriate remarks in response. CLAREL B. MAPES, secretary of the Mid-Continent Oil and Gas Association, gave a talk on "Outlook for the Oil Industry in Oklahoma."

The next speaker was NATHAN C. ROCKWOOD, editorial consultant of Rock Products, who read a paper on "Evaluation of Trends in Some Industrial Minerals." He spoke on the trends of common industrial minerals in the fields of agriculture, construction, and chemical and metallurgical industries. He mentioned the fact that agronomists have come to realize that it is now necessary to add numerous minerals to exhausted soils instead of just a few, as previously supposed. His evaluation of the most significant trend in the use of minerals today, is the remarkable increase in soil building. Mr. Rockwood also dwelt on the value of cooperation between producers and geologists in that no producer can

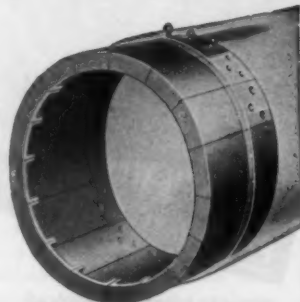
(Continued on page 122)



Robert H. Dett, director, Oklahoma Geological Survey

PYRASTEEL KILN ENDS

are a **POSITIVE**
means of preventing
BURNOUTS
LOSS OF KILN LINING
LOST OPERATING TIME



Showing discharge end of cement kiln fitted with PYRASTEEL Segmental Kiln Ends.

A recent survey of the industry reveals that PYRASTEEL kiln ends last for years—five to seven in most cases.

Don't wait until you are too busy to do it. Put them on **NOW** and avoid trouble later.



Unit segments are easy to install or replace.

Write for Bulletin of This
Heat-Resisting Alloy

CHICAGO STEEL FOUNDRY COMPANY
PYRASTEEL for hightemperatures **EVANSTEEL** for strength
REDZIE AVE. & 37TH ST.
CHICAGO 32, ILL.
Makers of Alloy Steel for 30 Years

POST WAR CONSTRUCTION CAN BE DESIGNED NOW

Types of Projects Solicited

SILOS— "Sliding Form" Method
STORAGE— for all Granular materials
BUILDINGS OF ALL TYPES—
Industrial or Commercial

RETAINING WALLS
RESERVOIRS
PUMPING STATIONS
CEMENT PLANTS

YOU CAN PROFIT BY OUR
TWENTY-FIVE YEARS OF EXPERIENCE

OUR ENGINEERS AND CONSTRUCTION CREWS
ARE AVAILABLE FOR QUICK CONSTRUCTION

E. C. MACHIN COMPANY
BUILDERS

COMMONWEALTH BUILDING

ALLENTOWN, PA.



made to meet the needs of
ROCK PRODUCTS OPERATORS

- Made from selected steels
- Internally lubricated
- **PRE**formed
- Made by craftsmen with years of experience

... the **CORRECT** Rope for your equipment

ASK FOR MACWHYTE CATALOG!

170 pages of information. Please request it on your company letterhead from any Macwhyte Wire Rope Distributor or from:

NO. 773

MACWHYTE COMPANY

2949 Fourteenth Ave., Kenosha, Wis.

MILL DEPOSITS: New York, Pittsburgh, Chicago

Ft. Worth, Portland, Seattle, San Francisco

Distributors throughout the U. S. A.

(Continued from page 121)

know enough about the geological structure of his deposit.

Afternoon Session

The afternoon session was opened by **GEORGE J. STEIN**, a past president of the Conference. He introduced **LLOYD JUDD** of the National Aid Life Insurance Co., Oklahoma City, who spoke on "Financing New Industrial Developments." The next speaker, **A. L. BURWELL**, chemical engineer of



George J. Stein

the Oklahoma Geological Survey, then read a paper entitled "Seven Keys to Industry." Following Mr. Burwell was **OSCAR MONRAD**, industrial engineer, who spoke on "Possi-

bilities for Developing New Industries in Oklahoma."

A round table discussion, mostly concerning freight rates, concluded the conference.

Fluorspar Development

A **ONE-MAN FLUORSPAR MINE**, operated by **Louie Gold**, is being exploited to produce this strategic war mineral which currently sells at \$30 per ton. Located about 100 miles southwest of Denver, Colo., in the Tarryall range, the mine is worked whenever Mr. Gold finds time to do so. A truck engine is used to hoist the mine car when filled with fluor-spar from the 75-ft. shaft in the mine. When the two 9-ton bins on the surface are filled, a hauling contractor removes the mineral. The mine is on a 160-acre mountain ranch homesteaded by Mrs. Edith Williams, a sister of Mr. Gold's.

Wisconsin Syenite Deposit

ERNEST F. BEAN, Wisconsin State Geologist, has reported on the discovery of what is believed to be the only known formation in the United States of nepheline syenite rock near Wausau, Wis. The only other known deposit in North America is to be found in Ontario, Canada, states the report. Heretofore nepheline syenite has been imported from Canada for use in the glass industry. Use of the rock increases luster in the glass, and adds toughness.



• Whether the work calls for sising, dewatering or recovering all kinds of wet or dry materials, you can depend on Link-Belt Screens to do the job. They are known for their high efficiency and low-cost operation, the result of over 20 years' experience in the design, manufacture and application of screens of all types. Made in a number of standard sizes—single or multiple decks, with or without enclosures, for light, heavy or extra-heavy duty. Complete data given in Books 1762 and 1977. Specify Link-Belt and be assured of "job-tested-performance."

LINK-BELT COMPANY

2045 W. Hunting Park Ave., Philadelphia 40

300 W. Pershing Road, Chicago 9

Offices in Principal Cities

LINK-BELT Vibrating SCREENS

"Industrial" CUT GEARS • CUT SPROCKETS

... make your drives behave!

Because:

They're precision cut on most modern machines.

Minutely inspected for tooth profile, space, pitch and hardness ... guaranteeing quality.

Our vast facilities, skilled personnel and individualized service will please you. Let us assist you with your Gear, Sprocket or Rack problems.

Write for 272 page Catalog and Engineering manual.



INDUSTRIAL GEAR MFG. CO.

THE PLANT THAT QUALITY AND SERVICE BUILT

4544 VAN BUREN STREET
CHICAGO 24, ILLINOIS

Road Builders Meeting

(Continued from page 106)

per year for three years is almost the exact amount spent by the Federal Government in each of the years from 1934 through 1941 for work-relief highway projects. He also spoke about the road-user revenues and the steps taken by many States to keep this revenue from being diverted to channels other than road construction and maintenance.

SIDNEY J. WILLIAMS, general manager, National Safety Council, gave an address entitled "Building Safety Into Our Highways." He stated that good engineering design will eliminate many accidents that occur on some of the older, narrower roads on which we drive today. He feels that the enormous highway construction program which will follow the war offers an unparalleled opportunity to build safety into our highways.

Airport Construction

LOWELL H. SWENSON, general manager, National Aeronautics Association, read a paper on "A New Market for the Construction Industry." This pertained to the construction of air strips and the many additional planes that will be in use for civilians after the war. He said, "At present there are only 286 communities in all of the United States served by air transport companies. Yet there are more than 6000 communities in this country with populations of 1000 persons or more. In most of the nation there is only one landing facility for every 1230 sq. miles." He also said that "Government and industry estimate that when the war is over, no less than six million persons are going to be interested in aviation. But they aren't going to be interested in private flying unless landing facilities are made available to them. That's where the National Airport Program comes in. It is proposed to spend in excess of \$2,000,000,000 on landing areas. We have something less than 3000 landing areas now. It is proposed to improve about 1600 existing landing fields and build 3050 new ones."

LESLIE L. SCHROEDER, commissioner of aeronautics, State of Minnesota, read his paper dealing with "Airports and Industry" in which he mentioned the large part airport construction will play in the post-war period. He said that, in addition to the construction of the airport, we must consider also the construction of access roads to these airports. "Aviation needs more airports and more runways, but it also needs roads, and the experience of road builders," he said.

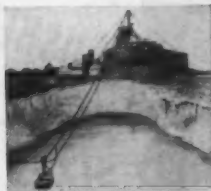
CHARLES B. DONALDSON, director of airports, Civil Aeronautics Administration, spoke on the importance of civil aviation in the National econ-

(Continued on page 124)

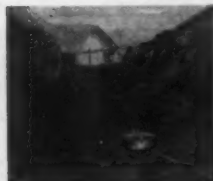
SAUERMAN

Long Range Machines

SAVE LABOR! SAVE POWER! SLASH COSTS!



Sauerman Cableway at Work in Deep Wet Pit



Sauerman Scraper Moves Loose Rock to Crushing Plant

MAJOR savings result when Sauerman Power Scrapers and Slackline Cableways are used in sand and gravel excavation, stockpiling and other material-handling jobs where the long operating range of these machines can be employed to advantage.

With one man at the controls, and with a relatively small expenditure of power, a Sauerman machine will dig, haul and automatically dump a large hourly tonnage of any class of earth or bulk material. Moreover, the first cost of the equipment is moderate and upkeep is simple.

Tell us about your excavating and material-handling problems. If we think Sauerman equipment will meet your needs, we will offer suggestions and send you our catalog.

SAUERMAN BROS., Inc., 530 S. Clinton St., CHICAGO 7

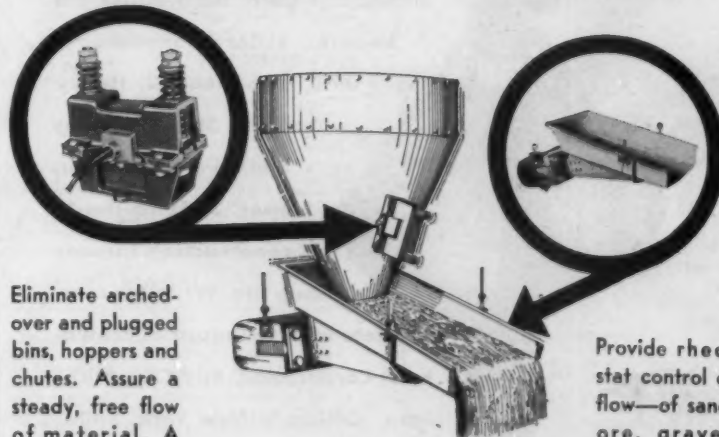
SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS

"Vibra-Flow"

VIBRATORY FEEDERS



Eliminate arched-over and plugged bins, hoppers and chutes. Assure a steady, free flow of material. A model for every problem.

etc., to belt conveyors, crushers.

Catalog literature available on request

SYNTRON CO., 450 Lexington, Homer City, Pa.



**AMERICAN
CRUSHERS**

PRODUCE THE DESIRED SIZES AT LOW COST

Time and again AMERICAN CRUSHERS have proved their ability to turn out at low cost the variety of size gradations demanded by today's and tomorrow's markets. Furthermore, they give trouble-free, long-lasting service at lower operating costs. Write today for detailed information on the AMERICANS.



"THE SHIELD OF
EFFICIENT CRUSHING"

AMERICAN PULVERIZER CO.

1245 Macklind Ave.

ST. Louis 10, Mo.

BROWNHOIST BUCKETS

Designed and built by Industrial

Brownhoist Corp. do a better job

because, 1) Large Sheaves re-

duce rope wear, 2) Heavy

Carbon - Steel digging

lips take deep, clean

bites, 3) Extra-sturdy

construction insures

long life. Write for com-

plete facts to Industrial Brown-

hoist Corporation, Bay City, Mich-

igan. Offices in New York, Phila-

delphia Cleveland and Chicago.

BROWNHOIST BUILDS BETTER BUCKETS

omy. He said that there are approximately 25,000 civilian aircraft in the United States today, and it is estimated that there will be 400,000 civil airplanes in this country within 10 years after the war. He stated that a Federal airport development program will meet all of the major specifications for useful public works.

HAL W. HUNT, associate editor, *Engineering News-Record*, read his paper on "Airport Maintenance Beyond the Hangar Line." In this, he dwelt on the maintenance of runways, including snow removal, maintenance of the concrete strips, drainage, and proper care of areas adjacent to the runways. He said "Whatever the cost of maintenance of airport surfaces may be, it is bound to be small in comparison to the damage that may happen if runways are permitted to get rough so that a plane does a ground loop, or if blowing dust fouls motors or obscures the runway."

THEODORE REED KENDALL, editor, *Contractor's and Engineer's Monthly*, spoke on "Airport Construction," in which he stated that the war has proven a real test for the construction ability of American-made machinery and American engineers. He said that the experience gained in building military airport facilities will insure speed and economy in the coming era of civilian airport construction.

ELLIOTT S. HANSON, president, International Training Administrations, Inc., read a paper entitled, "No Barriers Around American Know-How." He spoke about the Inter-American program for highway engineers and construction men of Latin America, and the relation of this endeavor to post war international trade. He said that we should share our American "know-how" with other nations for the promotion of international trade.

L. G. SCHRAUB, vice-president and general manager, Union Wire Rope Co., read his paper on "Advertising the Postwar Highway Program." He said that it was of prime importance that industry advertise the road program. He said, "I feel that it is our duty to advocate the study of worthwhile projects and to give them our wholehearted support."

In addition to the many interesting and timely papers read at the meetings, entertainment was provided by the "Maple City Four," and other entertainers at an "Old Timers' Buffet Supper," held Tuesday evening, Jan. 16.

Ceases Lime Manufacture

LEHIGH PORTLAND CEMENT CO. has discontinued the manufacture of chemical lime at its Buffalo, N. Y., plant where two of the four cement kilns were converted for this purpose in 1943, with a daily output of 250 tons going into war production.

National Gypsum Post-War Plans

MELVIN H. BAKER, president of the National Gypsum Co., in a recent interview with a reporter of the *Chicago Tribune* is reported to have said that, "management and labor cannot look to government spending as a source of wealth and jobs. That is the road to totalitarianism, to a surrender of freedoms and opportunities, to lower standards of living."

"Private industry, to perpetuate itself," said Mr. Baker, "must have well developed post-war plans for better production methods, for more capital in machines to make more and better products with better wages and with bigger markets. Too many industries are standing by doing nothing, expecting to chisel in on prosperity created by others."

"In the No. 1 post-war domestic problem — the relationship among government, management, and labor — management must recognize that labor exploitation is history, that labor's gains must be sustained. On the other hand, labor must get over the idea that it can run business or call in the government to blackjack management for an unfair share of earnings."

Mr. Baker said that the company has plans to spend \$9,000,000 for new plants, \$4,000,000 of which is now in the blue print stage and \$5,000,000 will be spent to build new plants at Baltimore, Md., and Shawsville, Va. He said that his company will show an increase of 25 to 30 percent in jobs in the first full post-war year over the 1939 level. Among the new products and improvements, he listed the following:

1. A thin, lightweight wallboard, nonwarping, fireproof, and sufficiently flexible to bend for use in decorations and displays in stores.
2. A partition panel, developed for cargo ship bulkheads and for transport ships, which will be a fireproof, moisture resistant, and sound insulated demountable partition for offices, warehouses, and plants.
3. A rock wool that will insulate the walls of a five room, \$5000 house for \$50.

4. A sheathing board for houses.
5. Laminated gypsum board for industrial roof decks where reinforced concrete has been used.
6. Calcined plaster for precision moulds and for use in grinding lenses.

Wins Cement Safety Trophy

UNIVERSAL ATLAS CEMENT CO., New York, N. Y., announced that two plants of the company went through the calendar year 1944 without a lost-time or disabling injury, and are thus entitled to reawards of the Portland Cement Association's safety trophy. The two plants are at Leeds, Ala., and Hudson, N. Y. This is the sixth time for Leeds and the third time for Hudson.

The Leeds plant first won the trophy in 1931, with rededications in 1932, 1935, 1940 and 1941; and the Hudson plant in 1936, with a rededication in 1939. No plant in the company has won less than two such citations, while those at Duluth, Minn., and Universal, Penn., have won nine and eight, respectively. The company's safety program is under the supervision of Gordon C. Huth, manager, industrial relations, Philip N. Bushnell, assistant manager, and John E. Carlson, manager of safety and compensation.

Sell Steel Interests

CONTROL of Colorado Fuel & Iron Corporation has been sold by the Rockefeller interests to Wickwire Spencer Steel Co., New York, N. Y. In addition to its iron ore mines, Colorado Fuel & Iron operates a flourspar mine at Wagon Wheel Gap, Colo., a limestone and dolomite quarry (Monarch quarry) at Garfield, Colo., and a dolomite quarry at Canon City, Colo.

Busy in New Mexico

EDGAR D. OTTO is reported to have installed new concrete block manufacturing equipment to meet a rapidly expanding demand for concrete products. A new roof construction also is being introduced. It consists of 8-in. reinforced cinder block joists with 4-in. cinder filler block.



Made of
Acid Open Hearth
Steel Wire

Round Strand
Flattened Strand
Preformed
Steel Clad
Non-Rotating

The Service Record of this
wire rope continues to make
and hold friends.

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
Established 1857

5909 Kennerly Avenue St. Louis, Mo.
New York — Chicago — Denver
San Francisco — Portland — Seattle



Male
or
Female
Threads

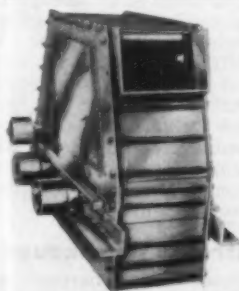
Recognized Universally
as the **ULTIMATE** in
Valves and Couplings

KNOX
MANUFACTURING CO.

810 CHERRY ST., PHILA. 7, PA.

Since 1911 Producers of

KNOX
Valve-Coupling-Nipple-Clamp-Mechanism



A DOUBLE IMPELLER CRUSHER

New Holland Model 3030

• Its astonishing efficiency reduces material from 30 in. to an optional minimum of 80% under one inch in one operation. Handles 100 to 150 tons per hr. with only 50 to 75 hp. For portable or stationary units. Combines expensive primary and secondary machinery in one operation. Write today for complete details on this new machine which operates on a new basic principle. Address Department RP-11.

NEW HOLLAND MACHINE CO.
NEW HOLLAND PENNSYLVANIA

GUARD AGAINST *Breathing* ROCK DUSTS WITH THESE APPROVED DUST RESPIRATORS



M.S.A. *Comfo* RESPIRATOR

APPROVED U. S. BUREAU OF MINES

Approved protection against all dusts. Large twin filters provide low breathing resistance. Simple and rugged design. Flexible facepiece fits all faces without adjustment.



M.S.A. *Dustfoe* RESPIRATOR

One of the most compact and lightweight approved dust respirators. No interference with vision or the wearing of goggles. All parts easily removed for cleaning or replacement.

MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STREETS
PITTSBURGH 8, PA.

RECENT DIVIDENDS		
Canada Cement Co., Ltd., pfd.	\$1.25	Mar. 20
Lehigh Portland Cement Co. ....	.25	Feb. 1
Lehigh Portland Cement Co.	1.00	Apr. 2
Longhorn Portland Cement Co., Com. (p8) .....	.25	Dec. 28
Medusa Portland Cement Co. ....	.25	Dec. 28
Medusa Portland Cement Co., pfd.	1.50	Jan. 1
Riverside Cement Co., pfd.	1.25	Feb. 1

NATIONAL GYPSUM Co., Buffalo, N. Y., will double the capacity of the \$30,000,000 ordinance plant which it operates for the government at Bluebonnet, Texas. It is expected that these facilities will soon be completed.

KENTUCKY ROCK ASPHALT Co., Louisville, Ky., has made a payment of 1½ percent fixed interest on January 1, 1945 (coupon No. 17) and 1½ percent contingent interest paid October 1, 1944, on first 3¼s-6½s due 1945.

CANADA CEMENT Co., LTD., Montreal, Canada, presented the following consolidated income account for the years ended November 30:

	1944	1943
Operating profit	\$3,816,678	\$4,108,404
Depreciation	1,625,000	1,750,000
Directors' fees, etc.	103,591	104,153
Balance	2,088,087	2,254,251
Income from invest.	69,298	71,405
Total income	2,157,385	2,325,656
Bond interest	405,255	442,284
Mortgage interest	17,300	19,300
Pension fund	100,000	100,000
Bd. refund. expense	110,000	110,000
Bd. redemp. expense	33,715	.....
Income & prof. tax	663,000	705,000
Net income	828,116	949,072
Preference dividends	1,004,345	1,004,345
Deficit for year	176,229	55,273
Previous surplus	3,585,509	3,640,782
Surplus, 11-30	3,409,280	3,585,509
†Times chg. earn.	3.80	3.89
Earned, pref. share.	\$4.12	\$4.72
*Earned, com. share.	d 0.80	d 0.59
No. of pref. shares.	200,869	200,869
No. of com. shares.	600,000	600,000

*Disregarding preferred arrears.

†Before income and profits taxes.

SCHUMACHER WALL BOARD CORPORATION, Los Angeles, Calif., had a net income of \$77,290, after taxes, for the six-months' period ended October 31, 1944. This compares with \$73,624 for a like period ended October 31, 1943.

INTERNATIONAL MINERALS & CHEMICAL CORPORATION, Chicago, Ill., has negotiated an \$8,000,000 ten-year 2¾ percent loan, proceeds of which will be applied to retirement on Feb. 20, 1945, of outstanding privately-held \$6,300,000 serial deb. 2½s and 4s, due in 1957, and to an expansion program. The new loan was arranged with First National Bank, New York Trust Co., Bankers Trust Co. and J. P. Morgan & Co., Inc., all of New York, Aetna Life Insurance Co. and

First National Bank of Chicago, and will be paid off at rate of \$400,000 annually, plus 20 percent of annual profits in excess of \$2,000,000. Average rate of interest on outstanding debentures is 3.9 percent and amortization has been at rate of \$600,000 per year.

COLUMBIA QUARRY Co., St. Louis, Mo., will hold a stockholders meeting on February 20 to authorize execution of a \$350,000 loan and issuance of a like amount of 5 percent secured notes, due 1959, in evidence thereof.

NATIONAL GYPSUM Co., Buffalo, N. Y., earnings for the final quarter of 1944 are estimated to have been below the average for the first nine months. This is due to the cutback in landing mat production at this company's metal lath plant at Niles, Ohio. Net earnings for the final 1943 quarter, after preferred dividends, was 15 cents a common share. The first nine months of 1944 showed net earnings after preferred payments, at 36 cents a common share compared to 35 cents for the same period in 1943.

Making Mortar Cement

UNIVERSAL ATLAS CEMENT Co., New York, N. Y., has announced that it is now shipping Atlas Mortar cement, a new product developed after many years of research. The product complies with the specifications of the Federal government and the American Society for Testing Materials.

As stated in the announcement, "The object has been to produce a mortar cement which would be outstanding not only in some single essential but in all the characteristics desired by bricklayers, masons, and masonry contractors. This applies especially to plasticity, yield, water retention, durability and strength."

Another point which the company stresses as of particular interest to masonry contractors, especially on large jobs, is yield—the amount of mortar produced by a bag of cement and the number of bricks, blocks, tile or other units that can be laid with the resultant mortar. Among other attributes underscored for this cement are low volume change; color properties entirely acceptable to the trade; durability in accord with a quality cement; and strength that meets all requirements.

Fire Destroys Warehouse

W. L. LOOMIS TALC CORPORATION, near Gouverneur, N. Y., suffered a \$30,000 loss when fire destroyed a large storage warehouse at their mill No. 2. About 200 tons of finished talc in paper bags was in the warehouse at the time.

FOR PERFECT SPREADS USE A BAUGHMAN

The machine that made LIME popular!



MANY NEW MODELS — 5 to 20 TONS CAPACITY

Manufacturers of the famous "Hi-Speed"
line of Self-Unloading Equipment.

Model E, Belt Conveyor Type	Model C, Clinker and Chip
Model D, Chain Conveyor Type	Model J, Spreader
Model H, Wide Chain Type	Model L, Transfer Type
Model F, Flat Bed Type	Model M, Car Unloader

Ask for recommendations—we have a reliable distributor near you.

BAUGHMAN MANUFACTURING CO., Inc.
Factories • Jerseyville, Illinois



No time for absentee wire rope

In a mechanized war, fighting equipment *dares* not be absent; industrial equipment *should* not. Even though your wire rope is carrying many an extra burden, proper care will prolong its life. So . . . make sure that inexperienced operators understand its *correct* use. Gear up rope inspection. Avoid damaged sheaves and drums.

The prime way to get top rope performance is to *start* with the stamina of Preformed Yellow Strand. Install it on power shovels for hoist and swing lines, and as crowd and rack ropes . . . on dragline machines, too, for hoist and drag lines . . . and on clam shells for holding and closing lines. Preformed Yellow Strand is a quarryman's mainstay that *will stay* on the job.

Broderick & Bascom Rope Co., St. Louis
Branches: New York, Chicago, Houston, Portland, Seattle
Factories: St. Louis, Seattle, Peoria

YELLOW STRAND

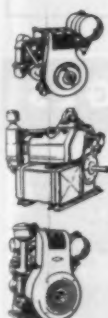


PREFORMED WIRE ROPE

PRECISION- GROUND CAMSHAFTS

another
"HIDDEN VALUE"

in all
WISCONSIN
Air-Cooled
ENGINES



The "Camomatic" is another of those more-than-human machines that help to put heavy-duty serviceability and smooth-running efficiency into every Wisconsin Engine.

This machine automatically rough-grinds (and subsequently "smooth-finishes") each and every cam for every Wisconsin Air-Cooled Engine. The grinding wheel finishes cam contour with absolute precision and uniformity. Every camshaft for a given size engine, is exactly like all the other camshafts for all the other engines of that size.

This is another of those features you don't "see" . . . but it performs an important service for you on the job, on your equipment.

Most H.P. per pound
WISCONSIN MOTOR
Corporation
MILWAUKEE 14, WISCONSIN, U.S.A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service



EARLE C. BACON, Inc.

17 John St., New York, N. Y.

OBITUARIES

BENJAMIN B. PUTNAM, founder and president of the former Marietta Sand and Gravel Co., which he sold to the Ohio River Sand and Gravel Co., Marietta, Ohio, died recently at the age of 73. For many years before his death Mr. Putnam was engaged in the real estate business and served as president and treasurer of the Marietta Realty Co.

J. E. CRUMMEL, proprietor of the Orrville Cast Stone Co., Orrville, Ohio, died recently while attempting to free his car from a snow drift. He was 61 years old.

ALFRED B. RUHLY, auditor and office manager for the Huron Portland Cement Co., Detroit, Mich., died January 4 at the age of 61. Mr. Ruhly entered the employ of the cement company in 1908.

MRS. ELLA CLAPP THOMPSON of Bakersville, N. C., owner and operator of a number of mica mines in Mitchell county, died recently in a hospital in Asheville. She was 74 years old. Mrs. Thompson came from a family instrumental in establishing western North Carolina as a mica mining center. Her father, with J. G. Heap, established the famous Sink Hole mica mine near Bandana in

1870, which is still producing today. She also operated a number of other mines in the area including the Cloud Land mica mine which also has been in operation since 1870.

CLYDE T. MORGAN, accountant, Colonial Mica Corp., Asheville, N. C., died January 6. He was 51 years old. Mr. Morgan was at one time connected with the city tax department.

JOSEPH H. CALLAHAN, production manager of the Acheson Graphite Co., Niagara Falls, N. Y., passed away recently.

J. W. GILLESPIE, of Dallas, Texas, southwestern representative for the Flexible Steel Lacing Co., Chicago, Ill., died December 18 at the age of 53. He had been a resident of Dallas, Texas, for the past eight years and was widely known in Texas, Louisiana, Arkansas and Oklahoma by mill supply, hardware, and industrial men.

THOMAS HOWIE SUTTON, southern sales director for the Louisville Cement Co., Louisville, Ky., died December 25 at his home in Fayetteville, N. C. He was 60 years of age.

JOHN J. WANICEK, vice-president of the Nelson Concrete Stone Co., Baltimore, Md., died on Christmas Day. He was 47 years old and had

HAMMOND
MULTI-WALL PAPER BAGS

Sewn and Pasted
Open Mouth and
Valve Paper Bags.
Your Inquiries Invited.
WRITE TODAY!



HAMMOND BAG & PAPER CO.
Paper Mill and Bag Factory WELLSBURG, W. VA.

ENSIGN - BICKFORD

Safety Fuse

PRIMACORD-BICKFORD

Detonating Fuse

THE ENSIGN-BICKFORD COMPANY

Simsbury - Connecticut

From the **SMALLEST** to the **LARGEST TONNAGES**

TYLER-NIAGARA SCREENS

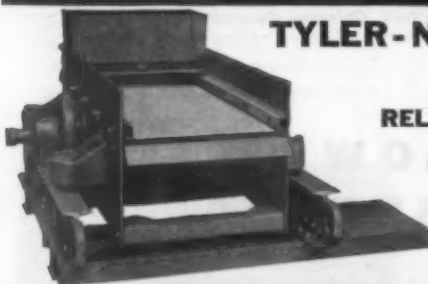
are

RELIABLE

HIGH CAPACITY

EFFICIENT

ECONOMICAL



2' x 4' Type 100
Tyler-Niagara
Screens



6' x 14' Type 800
Tyler-Niagara Screen

THE W. S. TYLER COMPANY, Cleveland 14, Ohio

WE OWN AND OFFER

NEW AND USED EQUIPMENT

DIESEL GENERATORS

- 1—Diesel Generator Set, 300 HP., Fairbanks-Morse Diesel, 6 cylinder, Model 32, complete with auxiliaries, 237 RPM., direct connected to a 250 KVA Fairbanks-Morse Generator.

AIR COMPRESSORS

- 1—Ingersoll-Rand Duplex Air Compressor, Type XB, 552 cu. ft. motor driven.
- 1—Ingersoll-Rand Imperial, Type XB-2, Duplex Air Compressor, 12"x7 1/2"x12".

COOLERS AND DRYERS

- 1—10'x10' and others.

CRANES AND SHOVELS

- 1—P & H 1-yd. Shovel, Gasoline, Reconditioned.
- 1—Locomotive, 4-wheel, 10-ton, 25' boom, Brown Hoist Co.

CRUSHERS

- 2—No. 5-6-8 Gates Gyratory Crushers, Style D.
- Others—various types and sizes.

HOISTS

- 1—R. Flory Mfg. Co. single drum Hoist, Handles 11 ton car up 12% grade 500 ft. per min.

KILNS

Various sizes.

LOCOMOTIVE AND CARS

- 1—4-ton Vulcan Iron Works, Class AW-4, Worm Gear Gasoline Locomotive, 36" gauge.
- 6—5-yd. Koppel 2-way Dump Cars, 36" gauge.

DRILLING EQUIPMENT

- 1—No. 33 Ingersoll-Rand Leyner Drill Sharpener.
- 1—Improved Type No. 33 electric power Loomis Machine Company Clipper Drill, complete with motor.
- 2—Ingersoll-Rand DCB No. 430 Drills.
- 2—Denver-Gardner Co. (Turbo-Waugh) No. 27 Drills.
- 4—Denver-Gardner Co. (Denver-Waugh) No. 95 Drills.

FEEDERS

- 2—Ballez Pulverized Coal Feeders, Type No. 3, complete with steel hoppers, 8 1/2 ft. dia x 12 ft. cone bottom.

GRINDING EQUIPMENT

- 2—5 1/2"x12" Allis-Chalmers Tube Mills.
- 3—5 1/2"x20" F. L. Smidth Tube Mills, Silex Lined.
- 1—5"x22" Tube Mill.
- 1—5"x19" Tube or Ball Mill.
- 1—4-roll Raymond Mill.
- 3—Giant Griffin Mills.

ELECTRIC MOTORS AND MG SETS

- Large stock, rebuilt, AC or DC, 25 and 60 cycle.

TRACK SCALE

- 1—Fomestead (Carnegie-Illinois Steel) Standard Track Scale, 46", 100-ton capacity. Complete.

TURBINE

- 1—100 HP. Westinghouse Turbine, 2700 RPM., direct connected to 100 HP. Westinghouse Gear Reducer. Ratio 3 to 1.

WEBBER EQUIPMENT CO.

New and Used Equipment

17 East 45th St., MU. 2-6511

New York 17, N. Y.

FASTEST POURING



Almost Any Job of Concrete Can be Done Faster with **JAEGER** TRUCK MIXERS

"HIGH DUMP"

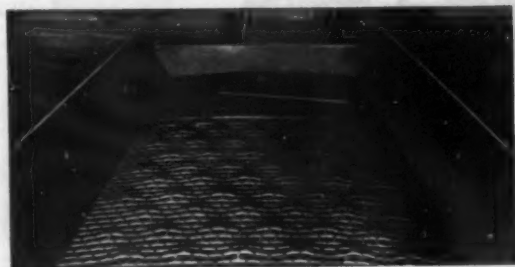
Millions of yards of Jaeger Truck-Mixed Concrete on major war work (exceeding the output of all other makes combined) prove the advantages of these motorized concrete plants. Nimble, flexible and fast, they speed placement, solve problem of extended or continuous pours.

THE JAEGER MACHINE CO.,
803 Dublin Avenue
Columbus, Ohio

Mixers—Pumps—Hoists
Paving Equipment



For More Economical Screening of Abrasive Materials!



Heat treated for extra toughness, Hendrick High Carbon Steel outlives other metals commonly used in vibrating and shaking screens. Definitely the "preferred" material where high abrasion-resistance is essential, Hendrick High Carbon, Heat Treated Steel is perforated to your individual specification in any size or shape of opening—round, square, hexagonal, slotted, "Squarround," or special type. Use this well known Hendrick Steel for long-run economy and more efficient screening performance.

HENDRICK MANUFACTURING CO.

47 Dundaff St., Carbondale, Pa.

SALES OFFICES IN PRINCIPAL CITIES

PLEASE CONSULT TELEPHONE DIRECTORY

Makers of Elevator Buckets of all types. Mito Open Steel Flooring. Mito Shur-Site Treads and Mito Armorgrids. Light and Heavy Steel Plate Construction.

GRUENDLER CRAFTSMANSHIP

Serving Industry over 50 Years

Continuous Peak Production in Cement Plants

Depends Largely on Crushing Equipment

GRUENDLER CRUSHERS and PULVERIZERS

of heavy duty types with capacities to 300 tons per hour and larger—produce uniform fine product to increase capacities of Ball, Rod or Compeh Mills.



Cut-away View of Hammer Crusher
Mrs. of Double Roll & Hammer Crushers for Primary & Secondary Crushing

BULLETIN on large capacity HAMMER-MILLS mailed on request.

GRUENDLER

CRUSHER and PULVERIZER CO.

2915-17 North Market St., ST. LOUIS (6), MO.

been associated with the concrete industry for 24 years.

HUGH H. PURKHISER, superintendent of the Mitchell, Ind., plant of the Lehigh Portland Cement Co., Allentown, Penn., died suddenly December 29 while on a holiday visit with friends at Jackson, Tenn. He was 59 years old. Mr. Purkhiser had been with the cement company 42 years and had been superintendent since 1943.

EUGENE VOSBERG, regional manager of the Victor Chemical Works, Nashville, Tenn., died recently.

THOMAS W. BACCHUS, retired vice-president and director of Hercules Powder Co., Wilmington, Del., died December 30 after an illness of several weeks. He was 82 years old. Mr. Bacchus resigned from Hercules in 1941, after 47 years of distinguished service in the explosives industry. During this 47 years he contributed many innovations and improvements in the manufacturing technique, and for many years he was recognized as the dean of the explosives industry.

GEORGE S. WHYTE, chairman of the board of the Macwhyte Co., Kenosha, Wis., died suddenly December 16 at his home in Kenosha. He was 77 years of age. Born in Crossgates, Scotland, March 20, 1867, Mr. Whyte came to this country with his family

in 1884. After working at various jobs he found an opportunity to join the sales force of the Washburn & Moen Co., makers of wire rope. In 1896 he became part of the Leschen Macomber Whyte Rope Co. A factory building was erected at Coal City, Ill., in 1901, and the business thrived. The company moved to Kenosha in 1912. His son, Jessel S. Whyte, became foreman in the mill in 1914 and rose to the position of president and general manager, taking over many of the business responsibilities from his father, who became chairman of the board.

BEN D. REYNOLDS, president and manager of the Independent Gravel Co., Joplin, Mo., passed away recently. He is survived by his wife, one daughter, a step-daughter, and two brothers.

New Incorporations

U. S. Mica Co. of New Jersey, Inc., Wallington, N. J., has been incorporated with a capital of 2500 shares. James B. Preston, Jr. is the agent.

C. & C. Mica Products, Inc., 45 Union Ave., Jamaica Plain, Mass., has been organized with a capital of 400 pfd. shares at \$100 and 500 common shares. Charles W. Davis, 139 Beacon St., Framingham, Mass., is president; Edward P. Cooper, 11 Melville Ave., Dorchester, Mass., is treasurer, and Irwin Springer, 27 South St., Brighton, Mass., is clerk.

U. S. Insulating Mfg. Corp., Asheville,

N. C., has been granted certificate of incorporation to deal in mica and all kinds of mica products. Authorized capital stock is \$100,000, and stock is reported subscribed in the sum of \$3,000 by Sigbert Loeb, Florentine Loeb and Helmi Berndt, all of Asheville. Offices in Woodfin Apartment Bldg., facing Asheville-Biltmore Hotel.

Indian Lime & Crushed Stone Co., Holdenville, Okla., is the name of a new company incorporated by Paul Taylor. Capital \$25,000.

Mineral Mix Products Corp., Manhattan, N. Y., has been organized to deal in silicate mineral products, with a capital of 100 shares, no par value. Samuel Sculnick, 21 E. 40th St., New York, N. Y., is the agent.

Manufacturers' News

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced the appointment of Jay C. Warner to assist in the development of sales in the Far East, Australia, and New Zealand.

General Electric Co., Schenectady, N. Y., has made the following changes in personnel in the apparatus department: C. H. Lang, vice-president and manager of apparatus sales, has also been given the direction of application and service engineering in the apparatus department; A. K. Bushman has been made manager of application and service engineering; H. V. Erben, commercial vice-president and manager of the Central Station Divisions, has been named assistant general manager; H. A. Winne, vice-president, is manager of engineering; Nell Currie, Jr., is manager of manufacturing; Guy S. Hyatt, assistant comptroller, is in charge of accounting, W. W. Jenkins of the Law Department, is counsel; E. D. Spicer, formerly vice-president responsible for apparatus manufacturing



**PERFORATED METAL
SAND AND GRAVEL SCREENS**

Manufactured exactly to your specifications
Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices

CHICAGO PERFORATING CO.
2437 West 24th Place
CHICAGO, ILLINOIS
Canal 1459



WILFLEY
centrifugal SAND PUMPS

for Slurries, Sand Tailings, Slimes, Acid Sludges

Save Pumping Cost

Continuous operation without attention for long periods. Stuffing box, stuffing, gland water ALL eliminated. Close clearances maintained by easy slipper seal adjustment. Heavy pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. Write for Complete Catalog.

A. R. WILFLEY & SONS, Inc. Denver, Colo., U. S. A.
NEW YORK OFFICE: 1775 BROADWAY



HAYWARD
BUCKETS

**USE RIGHT BUCKET
FOR THE JOB**

Hayward makes all four—clam shell dragline, electric motor, orange peel. A Hayward recommendation is unprejudiced.

THE HAYWARD COMPANY
202-204 Fulton Street
New York, N. Y.



McLANAHAN
EQUIPMENT
CRUSHERS

Single and double roll and jaw crushers, hammer mills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists.

SCREENS

Complete portable, semi-portable and stationary crushing, screening, and washing plants for different capacities of any materials.

McLanahan & Stone Corp. Established 1895
HOLLIDAYSBURG,
PENNSYLVANIA

When the Contract Calls for **SPEED**



be sure your Buckets are **RIGHT**

For rehandling, excavating or dredging Blaw-Knox builds buckets that get the most work done with the least crane time. They're safe, long lasting and easy on wire rope. For comprehensive data on the complete line of Blaw-Knox Buckets, write today for Catalog 2002.

BLAW-KNOX DIVISION

Of Blaw-Knox Company

2035 FARMERS BANK BLDG., PITTSBURGH, PA.
NEW YORK • CHICAGO • PHILADELPHIA • BIRMINGHAM • WASHINGTON
Representatives in Principal Cities

BLAW-KNOX BUCKETS

"PENNSYLVANIA" Reversible Hammermill Crushing Hard Hudson River Cement Rock



Because of their better technique, "two-way" REVERSIBLES have almost completely replaced the older "one-way" "Pennsylvania" Hammermills.

In this modern 2-stage design, the heavy primary crushing is against a series of powerful Manganese Steel Anvils, Adjustable duplex Cages for both right and left hand rotation—no "Hammer Turning"—oversize SKF Roller Bearings—rugged STEELBUILT construction—unusual accessibility.

Capacities 10 to 600 T.P.H. Patented. Bulletin No. 1030.

OUR ENGINEERS ARE AT YOUR SERVICE



1706 LIBERTY TRUST BLDG.

PHILADELPHIA 7, PENNSYLVANIA

New York, Pittsburgh, Chicago, Los Angeles, Birmingham
Associated with Fraser & Chalmers Engineering Works, London



"WIRE SCREENS?" SURE BILL—BUY 'CLEVELAND'—WE DO!"

Tough, Durable, Accurate Wire Screens for Vibrators or Rotary Jackets

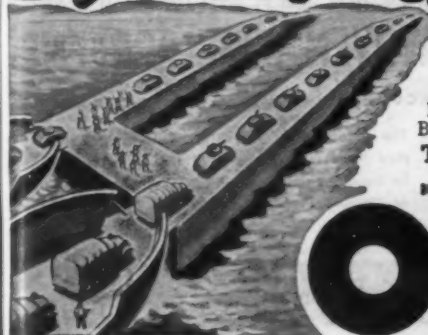
Cleveland is the "Buy" Word of Quality

THE CLEVELAND WIRE CLOTH & MFG. CO.

3574 E. 76TH STREET

CLEVELAND, OHIO

Speed Up **HANDLING OPERATIONS**



Ingenuity in developing amazing portable docks speeded the invasion of Europe. Similarly inbuilt features of design in Owen Buckets speed up the digging and handling capacities of these popular buckets. Buy Owens for resultful operation.

The OWEN BUCKET Company
6040 Breakwater Avenue • Cleveland, Ohio
BRANCHES: NEW YORK PHILADELPHIA CHICAGO BERTLEY, CAL.

OWEN **—BUCKETS**



A MOUTHFUL
AT EVERY BITE

PERFORATED METAL SCREENS

ANY SIZE—ANY SHAPE—ANY
METAL—ANY PERFORATION

Perforations are properly spaced to give maximum screening efficiency and strength.

Send for catalog showing wide variety of perforations, metals, etc.

The Harrington & King
PERFORATING CO.
5830 FILLMORE ST., CHICAGO 44, ILL.
118 LIBERTY ST., NEW YORK 6, N. Y.

is now a member of the president's staff, in charge of employee relations and consultant on general manufacturing matters; William R. Burrows, a vice-president of the company since 1927 and chairman of the labor relations committee, retired December 31; Roy C. Muir, formerly a vice-president of the executive staff, will become general manager of the apparatus department; and Earl O. Shreve, vice-president and chairman of the apparatus operating committee with responsibility for all apparatus sales, has relinquished these duties to become a member of the president's staff in charge of the company's customer relations.

Mack Trucks, Inc., New York, N. Y., announces the appointment of J. E. Savacool vice-president and comptroller, as a member of the board of directors. Mr. Savacool joined the company in 1913 as an accountant in the Chicago office.

Hercules Powder Co., Wilmington, Del., has announced the retirement of Walter M. Annette, manager of the New York City branch office for 26 years.

United States Rubber Co., New York, N. Y., has appointed H. S. McPherson of St. Louis as midwestern sales manager of the mechanical goods division, including Detroit, Cincinnati, Indianapolis, Chicago, Milwaukee and St. Louis. W. M. Bailew of Kansas City, Mo., has been given the post of southwestern sales manager comprising the territories of Kansas City, Tulsa, Denver, Houston, Dallas, New Orleans, Omaha and Minneapolis.

Stewart-Warner Corp., Chicago, Ill., has named Arden LeFevre as vice-president and director of engineering of Division One (alemite, instruments and radio); Fred R. Cross has been made advertising manager, and George W. Oehlisen, Jr., has been appointed assistant director of engineering, Division One. As director of engineering, Mr. LeFevre fills the vacancy left by the recent death of Fred Johnston.

General Electric Co., Schenectady, N. Y., has elected Dr. C. G. Suits, assistant to the director of the research laboratory, as vice-president in charge of the laboratory. Dr. W. D. Coolidge has retired as vice-president and director of the laboratory, a position he has held since 1940.

Barber-Greene Co., Aurora, Ill., announces the appointment of new representatives in Wisconsin. L. A. Larson, formerly district manager out of Milwaukee, has been promoted to area manager for Area No. 6 which includes Wisconsin, Minnesota, North Dakota, South Dakota, Montana, Wyoming, Nebraska, Iowa and a section of northwestern Illinois. Mr. Larson will maintain headquarters in Minneapolis, Minn. The new distributors are: Northeast Wisconsin and Upper Michigan, The Brebner-Sinz Machinery Co., Inc., Green Bay, Wis., and Marquette, Mich., construction and industrial division; southeast Wisconsin, The Milwaukee Power Equipment Co., Milwaukee, Wis., industrial division only; southeast Wisconsin, The Stone Mfg. Co., Milwaukee, Wis., construction division only; southwestern Wisconsin, Miller, Bradford & Risberg Co., Eau Claire, Wis., on construction and industrial; northwest Wisconsin, Miller, Bradford & Risberg Co., construction division only; northwest Wisconsin, Wm. H. Ziegler Co., industrial division only; southeast Iowa and seven Illinois counties adjacent to Davenport, Gierke-Robinson Co., Davenport, Iowa, construction and industrial divisions; central and northeastern Iowa, Gibbs-Cook Equipment Co., Des Moines, Iowa, construction and industrial divisions.

Worthington Pump & Machinery Corp., Harrison, N. J., has elected Clarence E. Searle as president of the company, to succeed Harry C. Beaver who was elected vice-chairman of the board of directors and chairman of the management committee. Hobart C. Ramsey, vice-president in charge of operations, was named executive vice-president.

WHEN YOU WANT Production UP—Costs DOWN



—you'll find Davenport Better-Built Locomotives the most effective means toward that end. This is a sound tip for those busy post-war days when construction booms and your capacity to produce is really tested. Davenports are the last word in modern dependability. They are superb performers—efficient, lasting and easy to operate. Tell us your needs. We'll gladly submit recommendations without obligation.



Entrust Your Post-War Haulage to Modern Davenports

EXPORT
OFFICE

BROWN & SITES

50 Church St., New York
Cable Add. "BROSITES"

DAVENPORT LOCOMOTIVE WORKS
A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA

TRUXMORE

WORLD'S BEST 3RD AXLE

CARRIES two payloads in one.
SAVES in first cost (up to 40%), on insurance (up to 50%), fuel costs (up to 20%), tires (50% to 100% longer life), road time (up to 20%), breakage of fragile loads, license fees, dead weight, maintenance costs.
Write for Circulars

DOUBLES YOUR TRUCK CAPACITIES

1791 FILLMORE AVE.

TRUCK EQUIPMENT CO. INC.
BUFFALO, N. Y.

NATIONWIDE SALES & SERVICE
THRU TRUCKSTELL DISTRIBUTORS



WOVEN WIRE SCREENS

ACCURATE • DURABLE • ECONOMICAL

The reliability of T.C. Alloy Screens has carried them into all parts of the world. Made in Standard and Special Weaves, with Square or Oblong Openings— from 10 mesh, .035" wire on up. Write today for Catalog No. 42.

TWIN CITY IRON & WIRE CO.
35 W. WATER STREET • ST. PAUL 1, MINNESOTA

lady, N.
assistant
labora-
of the
has re-
ctor of
has hel

Ill., an-
v repre-
Larson,
Milwau-
manager
sconsin,
Dakota,
owa and
ola. Mr.

riters in
ributors
Upper
achinery
quette,
al divi-
Milwau-
wauke-
theast
Milwau-
n only,
Bradford
on con-
est Wis-
erg Co.,
orthwest
indus-
wa and
to Dav-
venport,
al divi-
Iowa,
Moine,
al divi-

y Corp.,
ence E.
any, to
ected
directors
at com-
resident
ed ex-

E
UCK

CO.

RVICE
UTORS

ENS

ICAL

car.
side
are
35"
42.

O.
ATA

utive vice-president; Edwin J. Schwan-
hauser, vice-president in charge of man-
ufacturing and sales operations in Buf-
falo, was elected vice-president in charge
of sales; Leslie C. Ricketts, manager of
the Harrison Works, was made a vice-
president.

Davey Compressor Co., Kent, Ohio, has
announced the appointment of Hoye and
Williams, 1417 Dalzell St., Shreveport,
La., as agents for the Davey line in the
northern Louisiana territory, and the
addition of General Machinery & Equip-
ment Co., Inc., 801-15 Woodland Ave.,
Kansas City, Mo., as a new franchise
dealer.

R. G. LeTourneau, Inc., Peoria, Ill., has
promoted Cloyd W. Richards to assistant
service manager and Sam E. Beebe to
manager of service engineers. Mr. Rich-
ards has been with LeTourneau since



Cloyd W. Richards



Sam E. Beebe

1937 and spent one year in the parts
department before becoming service pub-
lications editor. Mr. Beebe, who joined
the company in 1937 as Eastern service
manager, has been assigned to highly
specialized current and post-war service
research duties.

Gardner-Denver Co., Quincy, Ill., has
reorganized its export division by estab-
lishing the main office of the export de-
partment in the Woolworth Bldg., New
York, N. Y. The new office will be head-
ed by G. V. Leece, vice-president of the
company. S. T. Brown, assistant man-
ager, and Harold Weber, assistant sales
manager, will be associated with Mr.
Leece in New York. Edward Church will
join the export division in Denver, Colo.,
and C. E. Kaiser, who was assistant ex-
port manager under Mr. Church, will be
in charge of the export division in
Quincy, Ill.

Allis-Chalmers Mfg. Co., Milwaukee,
Wis., has appointed Archibald J. Cooper
as manager of the New York district
office. Mr. Cooper, formerly assistant
manager of the New York office, suc-
ceeds A. F. Rolf, who now will devote
full time to his duties as assistant sec-
retary of the company.

Thermoid Co., Trenton, N. J., has an-
nounced plans to purchase Grizzly Man-
ufacturing Co.'s West Coast plant and
equipment located at Los Angeles, Calif.
The purchase will include the complete
line of Grizzly oil field, industrial rub-
ber and aviation products and all pat-
ents covering those products, including
inventories and accounts receivable.

Cummins Engine Co., Inc., Columbus,
Ind., has announced the appointment of
F. W. Sparks as manager of the Cleve-
land region, with headquarters at 805
Fidelity Bldg., Cleveland, Ohio. This
region includes Ohio and Michigan.

Chain Belt Co., Milwaukee, Wis., an-
nounces the appointment of M. D.
Moody, A. C. L. Warehouse No. 2, River-
side Viaduct, Jacksonville, Fla., as dis-
tributor of Rex construction machinery
in the Jacksonville area.

Wickwire Spencer Steel Co., New York,
N. Y., has announced the appointment
of H. C. Allington as assistant general
sales manager of the company and its
subsidiary the American Wire Fabrics
Corp.

Mack Trucks, Inc., New York, N. Y.,
has appointed John H. Middlekamp, re-
cently resigned director of the Auto-
motive Division of the War Production
Board, as manager of the Government
Department of the company.

PULVERIZERS for the reduction of Cement Mate-
rials, Limestone, Agricultural Limestone, Fire Clay
and All Dry, Refractory Materials.

Capacities: 1 to 60 tons per hour

Finenesses: 20 to 350 mesh

BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

To Increase Capacities or Fineness of Present Grinding Plant—

To Reduce Power and Maintenance Costs—

To Insure an Absolutely Uniform Product—

Use the BRADLEY AIR SEPARATOR

ERIE THE COMPLETE LINE BUCKETS



Hundreds of Erie Buckets
are being shipped monthly
for war uses. Straight line
bucket production experi-

ence means better buckets
for post-war and fast
delivery. Investigate the
complete Erie line now.

ERIE STEEL CONSTRUCTION CO. • ERIE, PA.

Aggregators • Buckets • Concrete Plants • Traveling Cranes

**MANGANESE STEEL
CASTINGS**

for
**PULVERIZERS
CRUSHERS
ROLLS
SCREENS**



for
**SHOVELS
DREDGES
CRANES
CONVEYORS**

The Frog, Switch & Mfg. Co.

Established 1881

CARLISLE, PA.

**GET READY
FOR
BUSINESS**

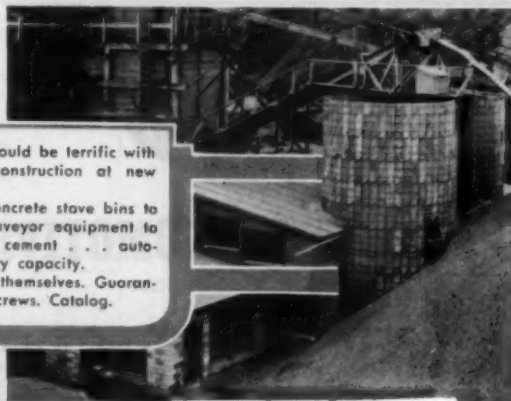
The next five years should be terrific with
road and building construction at new
peaks.

Install N & F super-concrete stave bins to
store and suitable conveyor equipment to
handle sand, gravel, cement . . . auto-
matically and fast. Any capacity.

Inexpensive—pay for themselves. Guar-
anteed. Expert erection crews. Catalog.

NEFF & FRY CO.

CAMDEN, OHIO



WHEN GERMANY FALLS CONSTRUCTION STARTS Prepare NOW for big business in CONTROLLED CONCRETE

Install **SC**² PRECISION
CONCRETE It Includes
CONTROL

Moisture Meter

Makes a test for
moisture content
of sand or stone
in ONE minute.
Accurate to 1/4
per cent.



Compensator
Delivers correct
DRY weight of
aggregates and
ADDED water.
Makes a graph
record of EVERY
BATCH.

SC² CONTROL produces uniform
concrete. Is always approved by
concrete engineers. Has definite sales value.
Write for our booklet "Profits in Con-
crete."

SCIENTIFIC CONCRETE SERVICE CORP.
McLachlen Bldg., Washington, D. C.

The B. F. Goodrich Co., Akron, Ohio, has announced the election of Dr. Robert V. Yohe as vice-president of American Anode, Inc., Akron, Ohio, a subsidiary. Dr. Yohe formerly was manager for the company of a government synthetic rubber plant near Louisville, Ky.

Taylor-Wharton Iron & Steel Co., Easton, Penn., announces the appointment of L. E. MacFadyen as works manager in charge of both the High Bridge, N. J., and Easton, Penn., plants. Succeeding Mr. MacFadyen as superintendent of the Easton plant, is James M. Sandt, who was formerly assistant superintendent. E. A. Swearingen continues as superintendent of the High Bridge plant. Both Mr. MacFadyen and Mr. Swearingen have been with the firm for many years, while Mr. Sandt joined the company in 1942.



L. E. MacFadyen

Johns-Manville Corp., New York, N. Y., has announced the election of Kenneth W. Huffine as vice-president of the Johns-Manville Products Corp., with headquarters in New York. Mr. Huffine formerly was manager of the Waukegan, Ill., plant.

Hewitt Rubber Corp., Buffalo, N. Y., announces that its new expansion program will permit increased output of conveyor belts, transmission belts and many types of industrial hose. The company also will enter the field of latex form and molded rubber articles for use in industry.

North American Phillips Co., Inc., New York, N. Y., has appointed Wesley L. Wilson commercial manager of the quartz crystal division. Mr. Wilson has

been purchasing agent for the company since 1942.

Wickwire Spencer Steel Co., New York, N. Y., has appointed William J. Murray assistant sales manager of the fence division, with headquarters at 500 Fifth Ave., New York, N. Y.

The Foxboro Co., Foxboro, Mass., makers of industrial instruments for measurement and control, has appointed Wendell A. Melton district manager in charge of the Tulsa, Okla., territory, with offices in the McBirney Bldg., Tulsa.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that for the second consecutive year the company will honor the men and women of one American industry each month as an intermission feature on their Saturday night broadcasts of the Boston Symphony Orchestra, which is heard over 189 stations on the Blue network at 8:30 p.m. Eastern War Time.

Lima Locomotive Works, Inc., Lima, Ohio, recently commemorated the 500th Lima Paymaster crane, shovel and dragline to be delivered to the U. S. Engineers Corps during 1944. The shovel was christened "Axis Grave Digger" by Miss Breta Brenneman of the shovel and crane division.

Army-Navy Awards

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., announces that its Army-Navy "E" Award for meritorious service on the production front has been renewed for the second time.

Chain Belt Co., Milwaukee, Wis., has received the Army-Navy "E" Award for the fourth time. The company received its original "E" pennant September 19, 1942.

The Cooper-Bessemer Corp., Mount Vernon, Ohio, has been awarded a fifth gold star for its Maritime Commission "M" flag. The company also flies the Army-Navy "E" pennant.

DENVER "SUB-A" FLOTATION CELLS

Flotation is slowly being applied to beneficiate and concentrate various products in the chemical field which cannot be obtained by other methods. The Denver "Sub-A" is standard the world over because it has a number of exclusive advantages. Bulletin No. F11-B.



NEW YORK CITY, NEW YORK: 10 Church St.
CHICAGO: Suite 1001, 44 W. Washington St.
SALT LAKE CITY, UTAH: 737 Main Street Bldg.
TORONTO, ONTARIO: 42 Richmond St. W.

MEXICO, D. F.: Edificio Reforma, Calle Epitafio No. 7
MIDDLESEX, ENG.: 4912, Northolt Rd. 1. Harewood
RICHMOND, ENGLAND: 139 Victoria Street
JOHANNESBURG, S. AFRICA: 3 Village Road



DENVER EQUIPMENT COMPANY, 1400 17th St., Denver, Colorado

UNIVERSALS . . .



... screen damp,
sticky material
WITH EASE

Whether the material to be screened is wet or dry, damp or sticky, UNIVERSALS give efficient, reliable and economical service. They are rugged, of simple construction and lowest in first costs and maintenance costs. Use UNIVERSALS. Write today for Catalog No. 107. —Contains 32 pages on Screens and Screening.

UNIVERSAL VIBRATING SCREEN CO.

RACINE — WISCONSIN



PLYMOUTH LOCOMOTIVES

• FROM 2 1/2 TO 70 TONS •

PLYMOUTH LOCOMOTIVE WORKS

Division of The Fate-Roof-Heath Co. • PLYMOUTH, OHIO, U. S. A.

**FIRST . . .
BUYING POWER PREFERENCE
NOW . . .
LARGEST INDIVIDUAL PAID MAIL CIRCULATION
ALWAYS . . .
EDITORIAL LEADERSHIP**

Three distinctions that help
get your story across in . . .

Backed by the Facts
**THE INDUSTRY'S
RECOGNIZED AUTHORITY**
309 W. JACKSON BLVD.
CHICAGO

**ROCK
PRODUCTS**

CLASSIFIED ADVERTISEMENTS

FOR SALE CRUSHING ROLLS

Type AA—Size, 72"x30".
Dismantled and in good condition.
Immediate shipment.

HALL METAL PRODUCTS CO.
1285 W. 9th St. Long Beach 6, Calif.

ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C.,
for sale at Attractive Prices. Large
Stock. New and Rebuilt. All fully
guaranteed. Send us your Inquiries.

V. M. NUSSBAUM & CO.
FORT WAYNE, IND.

LIME HYDRATOR FOR SALE

One continuous type Clyde Hydrator, 10 ft. com-
plete with stacks, capacity 5-7 tons per hour, in-
cluding Kuntz wash stack with motor pump, and
3 HP feeder motor. Purchased by us in 1943,
in fine condition.

KIMBALTON LIME COMPANY, INC.
Shawsville, Va.

PULVERIZERS

One (1)—Sturtevant Vertical Emery Mill, new
emery stones recently. Price \$675.00
Four (4)—Kent Maxco Ring Roll Mills, in
good running condition, may be seen in opera-
tion. Price, each, \$1675.00
One (1)—Bradley 3 Roll Pulverizer. Price, \$1150.00

WHITEROCK QUARRIES
Belleville, Penna.

New—RAILS—Relaying ALL SECTIONS

Also contractors' equipment, "V" shaped and
Western cars, 24 and 36-in. gauge, portable track,
gas locom. frogs and switches. Attractive prices
quoted. Wire, write or telephone for quotations.

M. K. FRANK
Park Bldg. 480 Lexington Ave. New York, N. Y.
Pittsburgh, Pennsylvania. Blitz Bldg. Reno, Nevada
Havana, Cuba

FOR SALE—REASONABLE

2—25 Cu. Ft. Besser Mixers.
1—18 Cu. Ft. Blystone Mixer.
1—Universal Tamper Block Ma-
chine.

CITIES FUEL & SUPPLY CO.
6439 W. National Ave.
West Allis, Wisconsin

GOOD VALUES—ALWAYS

1 1/2 yd. P & H 600A gas Crane & Dragline.
60HP to 1500 HP Diesel Power Plants.
35 HP, 2 Drum & Swinger Gase. Hoist.
10 and 20 Ton Capacity Steel Derrick.
24x18" American Ring Roll Crusher.
20x36" Universal Jaw Crusher—1942.

Mississippi Valley Equipment Co.
515 Locust St. St. Louis 1, Mo.

FOR SALE

Guaranteed used Steel Pipe
and Boiler Tubes
Wood and Steel Tanks
Buildings, Valves and Fittings
JOS. GREENSPON'S SON PIPE CORP.
Natl. Stock Yds., St. Clair Co., Ill.

DIESELS

ALL SIZES, TYPES

A. G. Schoonmaker Co.
50 Church St. Phone Worth 2-0455
New York 7, N. Y.
Business Established 1898.

DIESELS

ROBERT SCHOONMAKER
Port Washington, Long Island, N.Y.
Phone Roslyn 1220

PRICED RIGHT!

- 1—Fuller Kinyon Type C Portable
Transport Pump for unloading
dry, pulverized materials, 12 to
15 ton per hour, motor driven.
- 1—Vulcan 6"x42" Rotary Dryer, 1/2"
shell, located West Coast.
- 1—Vulcan 6"x60" Rotary Kiln and
4"x35" Rotary Cooler.
- 1—Set of 18"x10" Crushing Rolls.
- 1—Blake Jaw Crusher, 9"x15".
- 3—Oliver Rotary Continuous Filter,
5"x8", 6"x6", 3"x4".
- 2—Bucket Elevators 20' to 75'.
- 8—Belt Conveyors 20' to 50'.
- 5—Tyler Screens 3"x5", 4"x5".
- 1—Jeffrey Hammer Mill, 24"x18".

Partial List Only.

PURCHASERS AND LIQUIDATORS
OF COMPLETE PLANTS. SEND
US YOUR LISTS.

BRILL Equipment Co.
225 WEST 34th STREET, NEW YORK 1, N. Y.

Int. Diesel TD-14 Tractor with Bull-
dozer, and double drum winch.
45 ft. Crane Boom. Also Pullshovel
Attachment for Lorain 75-A or
75-B.

20 KW and 30 KW Int. & Cat. diesel
Electric Sets.
1 1/4 yd. Byers Gas Shovel.
1 yd. B-Erie Gas-Air Shovel.
14 ton Whitcomb Loco-Gas-36 Ga.
20 ton Plymouth Loco-Gas-Std. Ga.
27-E Smith Paver, Model H-31.
5—Electric Hoists, 40, 50 and 60 HP.
1 yd. Round Shaft Buckets.
1 yd. and 1/2 yd. Dump Buckets.
2—Shovel Attach. Byers Bearcat Jr.
Shovel Attachment for 41-B Bu-
cyrus-Erie.

J. T. WALSH

Brisbane Building Buffalo 3, New York

FOR SALE

- 6-ton Plymouth Gasoline Locomo-
tive—3 B/L—No. 1141—30" gauge
Friction Drive.
- 7-ton Plymouth Gasoline Locomo-
tive—3 B/L—No. 1190—30" gauge
Friction Drive.
- 4-ton Plymouth Gasoline Locomo-
tive—2 F. L.—No. 1685—30"
gauge.
- 12 Side Dump Koppel Cars—5 ton.
- 7 Side Dump Easton Cars—5 ton.
- 12 Front Dump Easton Cars.

NEW ENGLAND LIME COMPANY

260 Columbia St. Adams, Mass.

FOR SALE

90 H.P., 730 R.P.M. Wagner Motor, rebuilt,
guaranteed. 4" centrifugal ball bearing pump;
4" pipe; 40"x28"-6" rotary screen. Clyde Belt
Hoist; Florey Belt Hoist 3 speed; 3/4 and 1 yard
Pioneer Buckets; 3/4 and 1 yard Drag Buckets.
Priced right.

D. A. DAVIS

Crawfordsville, Ind.

No. 5 Allis Chalmers gyratory crusher.
11"x19" jaw crusher, top eccentric
30"x36" Jeffrey hammer mill
No. 4 Jumbo Williams hammer mill
20"x6" Pan feeder
Air Compressors, 100 to 1500 cu. ft.

WM. C. JOHNSON & SONS MACH. CO.
1211 Hadley St. St. Louis, Mo.

FOR SALE

Approximately 6,000 12x16
steel cored pallets

**CONCRETE & CINDER BLOCKS
PRODUCTS CO.**

10 Buell Rd. Rochester 11, N. Y.
Genesee 2121

FOR SALE DRAGLINES—SHOVELS

1400 P & H Electric Dragline.
100' boom, 4 yard bucket. Com-
pletely rebuilt.

Model 5120 Marion Electric Drag-
line with 100' boom and 3 yard
dragline bucket. Excellent condi-
tion.

1 1/2 Yard Osgood Combination
diesel shovel and dragline.

3/4 Yard Osgood Commander Gaso-
line Shovel. Rebuilt.

**FRANK SWABB
EQUIPMENT CO.**

Hazleton, Pa.
Telephone 3906

ENGINES — POWER UNITS

BARBER-GREENE Asphalt Plant, Model 842,
with engine, dryer, elevators, etc.

CONTINENTAL Scraper, 5 yd. capacity.

AHRENS aggregate mixer with power takeoff
drive.

SIMPLICITY Shaker Screen, 3-deck, also 4x8,
electric motor.

GOOD ROADS Crusher, 1640, roller bearing, jaw
type.

WORTHINGTON Portable Air Compressor, 315
cu. ft., powered by Hercules diesel engine.

CLEVELAND DR30 Wagon Drill on 3 pneumatic
tires.

GARDNER-DENVER Portable Air Compressor,
105 cu. ft., late model, on 4 steel wheels.

CONTINENTAL power unit, 6 cylinder, 75 h.p.
at 1750 R.P.M.

2—JAEGER 4XP Pumps, powered by 4 cylinder
air cooled gasoline engines, 30,000 G.P.M.

ROY-C-WHAYNE
SUPPLY COMPANY

800' W. Main St. Wabash 1375
Louisville 2, Ky.

4 Jeffrey-Traylor No. 4 Vibrating Pan Feeders,
two never used, two only slightly.

36" Traylor TZ Gyratory Crusher, belt drive.

No. 3 Williams Jumbo Jr. Pulverizer, rebuil.

20"x24" Greenview Double Roll Crusher.

12"x36" Buchanan Jaw Crusher.

14"x30" Cedar Rapids Jaw Crusher.

Universal 40"x20" Double Roll Crusher.

21"x12" McLanahan Single Roll Crusher.

Barber Greene Models 42 and 62 Bucket Loaders.

Austin-W Gravel Washing Plant.

3/4 yard Orton Crane, 47' boom.

1/2 yard General Shovel & Dragline Comb.

15-6 yard Sterling End dump trucks.

54" dia. x 40' Rotary Dryer.

18"x40' and 50' Belt Conveyors.

Raymond No. 60 Pulverizer, separator, collec'tor.

210 and 300 HP Fairbanks Morse Diesel Engines.

1 1/2 and 2 yd. Brooks Load Ladders.

MID-CONTINENT EQUIPMENT CO.

710 Eastgate Pa 2290 St. Louis 5, Mo.

FOR SALE

Crawler type—Steam shovel and
crane boom
3/4 yd.—Bucyrus Erie—Type B
Serial No. 984.

EXCELLENT CONDITION

MANLEY SAND COMPANY
ROCKTON, ILLINOIS

FOR SALE

One Universal Roll Crusher. Size of rolls, 20-in.
by 40-in. Has new gears, sprockets, chain and
manganese shells.

Also one Fire Truck. A complete pumper unit
mounted on a four wheel drive chassis, with
straight blade, Ross Snow Plow attached.

THE LUTZ COMPANY

Oshkosh, Wisconsin

1

FOR SALE

BUCKET ELEVATORS AND PARTS

Bucket elevators, 16", 18", 20" on chain or belt.
30" elevator, 8" malleable buckets on belt.
Continuous 14"x30" bucket elevator on chain.
Continuous 14"x40" bucket elevator on belt.
Continuous 30"x40" double strand bucket elev.
Grain elevators, 5" to 18" buckets on belt.
Link-Belt chain barrel elevator, 25".
300 feet No. 739 Pindle chain.
300 feet No. 3 Champion Oilwell roller chain.
300 feet Jeffrey No. 1123 roller chain.
150 feet L-B chain No. 847 with K2.
300 feet L-B chain No. 835 with A-42.
400 feet Ewatts malleable chain No. 124.
Selected chain sprockets, new and used.
New malleable elevator buckets, 20"x5"—AA.

CRUSHERS — ROLLS — MILLS

Allis-Chalmers 16"x42" double roll crusher.
Buchanan "C" 14"x30" double roll crusher.
Sturtevant Laboratory Rolls, 8"x5".
Acme 8"x31" type C jaw crusher, roller bearings.
Buchanan 10"x16" Blake type jaw crusher.
New England 11"x31" jaw crusher, cast steel frame.
Traylor "BULLDOG" 11" gyratory crusher.
Sturtevant No. 0 "ROTARY FINE CRUSHER".
Williams No. 2 hammermill.
Midwest No. 2 hammermill.
Robins double roll 24"x36" coal crusher.
Single roll coal crusher, 24"x34".
Simplex coal pulverizer, roller bearings.
Eight tons steel balls, 1" to 2".

STONE WORKING EQUIPMENT

2 Meyers stone saws, 48" and 60" dia. Electric.
1 Lincoln open side electric planer, 48"x12".
1 Lincoln open side electric planer, 36"x12".
1 Patch 36"x12" open side belted planer.

MISCELLANEOUS

Sauerman double drum 50 hp elec. dragline hoist.
National double drum 25 hp elec. standard hoist.
Chicago belted air compressor, 529CFM, NSB.
N. Y. Air Brake No. 6B Duplex steam air compr.
Speed Reducers, worm drive, 50-1 and 70-1 ratio.
Electric motors, 1 to 100 horse power.
Morris 6" manganese lined sand pump.
Ellicott 4" belted sand pump.
1" centrifugal water pump with 25 hp motor.
4" and 8" ton 36" gauge gasoline locomotives.
20" and 24" flat cars.
400 hp V-belt double pulleys with V-belts.
Waukesha 4 cyl. engine with speed reducer.
3 steel pontoons 4'x4'x14".

CONVEYORS AND PARTS

Sandwich 24"x36" steel belt conveyor.
Jeffrey Foundry mold conveyor, 42"x150".
Jeffrey Standard Steel Apron Feeder, 24"x27".
Steel plate conveyor, 47"x26".
Link-Belt Single Flight conveyor, 15"x56".
Hales Portable flat belt conveyor, 14"x24".
Belt idlers and conveyor belt.
Belt conveyor pulleys, 12" to 42" belt.
Belt trippers for 14", 16", 18" belt.
Weller 36" horizontal automatic belt take up.
Screw take ups, 12 foot center, 3 1/2" bearings.
Screw and gravity conveyors.
New and used conveyor belt.

VIBRATING AND REVOLVING SCREENS

3 "HUMMER" single deck 3'x5' vibrating screens.
1 "HUMMER" single deck 4'x5' vibrating screen.
15 cycle generators for "HUMMER" screens.
Robins "GYREX" double deck 4'x10' vibrating screen.
Simplicity three deck 3'x5' vibrating screen.
Deister "Flat-O" single deck 3'x7' vibrating screen.
"JIGGER" three deck 2'x5' vibrating screen.
Revolving screens: 4'x16", 4'x22", 5'x18".

G. A. UNVERZAGT & SONS

136 Coit St. Irvington, N. J.

MORTAR OR BATCH MIXING PLANT FOR SALE

Complete mortar or batch mixing plant with 55 ft. screw conveyor 9" with 5 HP Gear motor. Elevators 31 ft. centers complete with gear motor drive, two compartment heavy steel storage bin for 80 tons bulk cement and 20 tons Hydrated Lime. Sprout Waldren two-ton batch mixer with 20 HP Gear motor drive, all mounted on Howe, 15 ton suspension scales, plant good as new. Bar-fain.

BIMBALTON LIME COMPANY, INC.
Shawsville, Va.



LOCOMOTIVE

Std. Gauge
1—15-ton Vulcan std. ga. gasoline locomotive, No. 3903, MCB couplers.

AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

ELECTRIC CRANE

1—18 ton O. & S. Type B CRANE, mid. on 8' 6" ga. track, 56' boom. Power 53 HP 440/60/3 elect. mtr.

CRUSHERS

1—No. 2 Climax jaw crusher, size 9x16".
1—Acme jaw crusher, Ser. No. 1873, size 12x20".
1—Acme jaw crusher, Ser. No. 1686, size 9x16".
1—No. 3 Champion jaw crusher, size 7 1/2x13".
1—United Iron Works, "Blake-type" jaw crusher, size 9 1/2x24".
1—Sawyer Massey jaw crusher, size 9x18".
1—No. 9 New Holland jaw crusher, size 6x9".
1—Allis Chalmers, No. 6 gyratory crusher, Ser. No. 5331, opening 10x38".
1—Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35 1/2".

DERRICKS

5—Steel Guy Derricks: 3—20-ton American steel derricks: 1—110' mast, 100' boom; 1—100' mast, 80' boom. 1—15-ton American steel derrick, 83' mast, 60' boom. 1—5-ton Terry Guy Derrick, 70' mast, 60' boom. 1—5-ton Insley, 75' mast, 80' boom. Stiff leg derricks: 1—25-ton Hunter, 40' mast, 80' boom. Also a number of wood stiff leg derricks, 1 to 5-ton cap.

HOISTS (Elec., Gas, Steam)

85—Electric, ranging from 20 HP. up to 125 HP., consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.

PARTIAL LIST ONLY — SEND FOR 64-PAGE STOCK LIST

All this equipment is owned by us and may be inspected at one of our plants.
WE BUY — REBUILD — SELL AND RENT

—CHICAGO, 12— PHILADELPHIA 2
1119 So. 1511
Washtenaw Ave. Race St.
—PITTSBURGH 30— NEW YORK 7—
P. O. Box 933 30 Church St.
Dept. RP Dept. RP

FOR SALE

Austin Gyratory Crusher No. 107.
Buchanan Type B 12" x 36" Jaw Crusher.
Allis-Chalmers Double Roll Crusher, Garfield Type, size 54" x 20", with new manganese roll shells.
Allis-Chalmers Double Roll Crusher, Type XX, size 54" x 24", with new tire steel shells.
Lippman Scrubber Screen, 72" x 18", complete with G.E. 20 HP motor, 440 volt with starter.
Tyler Type 31 Tandem Hummer Screen, 8' x 5' surface with G.E. Type G2 Motor Generator Set.
Marion Type 450 Electric Shovel, crawler mounted, 22' boom, 1 1/2 yard bucket, equipped for 440 volt current.

Address inquiries to:

AMERICAN ZINC COMPANY OF
TENNESSEE

Paul Brown Building, St. Louis 1, Missouri

FOR SALE

20 sets of 3-Roll Anti-Friction Troughing Idlers for 30 inch belt, Type 70 Link Belt with roller bearings, and sufficient return idlers for the 20 sets, all in very good condition. Will trade for same type for 15" belt.

BATTLE CREEK GRAVEL CO.
BATTLE CREEK, MICHIGAN

Under all circumstances, good buyers seek the label that assures satisfaction. In construction equipment the "E.C.A."

label is a protection to the purchaser.

Gas hoists ranging from 8 to 120 HP., single, double and triple-drum; all standard makes (38 in stock).
Steam, ranging from 8 HP. to 60 HP., single, double and triple-drum; all standard makes.

PUMPS (Elect. Centrifugal)

HORIZONTAL:

1—10x18" Welman-Jaeger No. P-4201, power, 50 HP. AC motor; capacity 2500 GPM @ 35' head.
1—8x8" Worthington, 4 stage, No. 676005W, without power. Capacity 900 GPM @ 875' head.
1—8x8" Worthington, No. 816521, power 80 HP AC motor. Capacity 2000 GPM @ 50' head.
1—6x8" Morris, No. 109005, power 100 HP, 2200/60/3 slip ring motor. Capacity 1300 GPM @ 240' head. Shut off head 270'.
1—6x5" Fairbanks-Morse pump No. 441649, combination gas and electric power, one end Bucla engine, other end 50 HP AC electric motor, operate either power. Capacity 1000 GPM @ 150' head.
1—6x8" Denning pump No. DC41411, power 25 HP AC motor. Capacity 1000 GPM @ 70' head.
1—6x6" Allis Chalmers No. 5418, power 40 HP AC motor. Capacity 1000 GPM @ 50' head.
2—6x5" Union pumps, No. 174832, 174415, power 20 and 15 HP AC motors. Capacity 650-750 GPM @ 90-40' heads.
1—5x4" Dayton-Dowd pump No. 4713, power 10 HP AC motor. Capacity 500 GPM @ 40' head.
3—5x3" Ingersoll Rand pumps, 2 stage No. 79574, 79575, 80232, power 140 HP AC motors. Capacity 525 GPM @ 500' head.
1—5x4" Dayton-Dowd pump, No. 4713, power 10 HP AC motor. Capacity 500 GPM @ 40' head.
1—4x4" LaBour No. 4738, power 20 HP AC motor. Capacity 400 GPM @ 90' head.

BREDDING:

1—10x10" Morris, size 10A, No. 86864, cap. 87 cu. yds. per hr.
1—8x8" Cataract, No. 175895, cap. 2000 GPM @ 25' head.
1—8x8" Morris dredging pump, cap. 60 cu. yds. per hr.
1—4x4" Itherington & Berner, power 25 HP AC elect. mtr., cap. 450 GPM.

WE HAVE A LARGE STOCK OF CENTRIFUGAL, LIFT AND FORCE, JETTING, VERTICAL, TRIPLEX, ETC. PUMPS NOT SHOWN IN THIS LIST, GAS AND ELECTRIC POWER.

LOCOMOTIVES SHOVELS CRANES CARS

1—43 1/2 ton Porter 0-4-0 saddle tank locomotive, standard gauge, A.S.M.E. boiler, entire new firebox, rebuilt.
1—36 ton American 0-4-0 saddle tank locomotive, standard gauge, A.S.M.E. boiler, thoroughly overhauled.
1—7 3/4 ton Baldwin 0-6-0 separate tender switcher, full time I.I.C. papers, overhauled.

1—Whitcomb diesel locomotive, 36" gauge, with Caterpillar V-8 engine, air brakes, electric lights. This locomotive built in 1936 and has now been put in first class serviceable condition with new wheels, chains, sprockets, reversing gear, and bronze clutch plates. Weight is 30 tons in full working order.

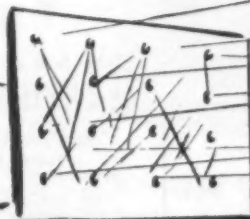
5—Western 30 yard two way air operated side dump cars, standard gauge, DROP DOOR TYPE, first class condition.

Birmingham Rail & Locomotive Co.
BIRMINGHAM 1, ALABAMA

FOR SALE

4—60 H.P. Fairbanks-Morse, 6 cyl., Stationary Diesel Engines, also reduction gears to 308 R.P.M., or can supply Electric Generators.

A. G. SCHOONMAKER COMPANY
50 Church St., N. Y. WO 2-0455



ALBANY

ST. PAUL

DALLAS

Coffeyville, Kans

PHILA

Long Distance Wires

Anybody listening in, for just a half an hour, to our busy phones realizes the CONFIDENCE which has been built up—from COAST TO COAST—in ECONOMY COMPANY SERVICE.

- GENERAL MANAGERS
- PLANT SUPERINTENDENTS
- PURCHASING AGENTS
- WORKS MANAGERS . . .

In all types of Rock Products Plants—

ALL of them—hard-boiled, practical, cost-conscious buyers—are calling us NOW, from all over the Country, and ordering shipments of:

- POWER SHOVELS—2 to 4-cu. yd. POWER SHOVELS
- SMALL SHOVELS— $\frac{1}{2}$ to $\frac{3}{4}$ -cu. yd. TRUCK SHOVELS
- MONIGHAN DRAGLINES • OVERHEAD CRANES • TRUCKS
- TRACTORS and BULLDOZERS (including the popular D-7 and D-8 Types. CATERPILARS, ALLIS-CHALMERS, CLETRAC and Others).

WHY?—Because they know we have long lists ready to draw from. And they appreciate our PRINTING ALL PRICES.

They know that the VALUES ARE GOOD, and never will be better.

Look Over This List Below and Satisfy Yourself.

JANUARY, 1945 SPECIALS

- $\frac{1}{2}$ yd Northwest Model 20 shovel and dragline, rebuilt and guaranteed, late model.
- $\frac{1}{2}$ yd recent model Insley K-16, excellent condition shovel, crane, backhoe, clamshell bucket, 60 day guarantee.
- $\frac{1}{2}$ yd P&H Model 150, excellent condition, shovel, backhoe, crane, two clam buckets, 10 wheel trailer.
- $\frac{1}{2}$ yd Northwest Model 2 shovel built in 1936.
- $\frac{1}{2}$ yd diesel Link-Belt Speeder shovel, 1910-1941 model excellent condition.
- $\frac{1}{2}$ yd. Unit shovel and backhoe combination, $\frac{1}{2}$ swing, real nice machine \$2950.
- Two Byers Bearcat $\frac{1}{2}$ yd skimmer, crane and shovel combination \$1650, each.
- Half swing Insley $\frac{1}{2}$ yd shovel in rather good operating condition at a bargain price \$1950.
- $\frac{1}{2}$ yd Bay City Model 25 shovel, backhoe combination, 1939 model, excellent condition.
- $\frac{1}{2}$ yd. Industrial Brownholt scraper shovel \$1400.
- $\frac{1}{2}$ yd Bucyrus-Erie 18/20 shovel, backhoe and solid tired trailer \$4900.
- $\frac{1}{2}$ yd Byers $\frac{3}{4}$ swing, Hercules 4-cyl. engine \$2750.
- $\frac{1}{2}$ yd Byers Model 28—38' boom. \$3100.
- $\frac{1}{2}$ yd General dragline, 35' boom, Page dragline bucket, \$4500, a 1938 General $\frac{1}{2}$ yd shovel and dragline combination—35' boom— $\frac{1}{2}$ yd bucket—6-cylinder Buda gas engine—rebuilt and guaranteed.
- $\frac{1}{2}$ yd Model R Insley shovel and backhoe combination. Condition only fair. Price \$2950.
- $\frac{1}{2}$ yd Link-Belt Speeder Model B-3 shovel in rather good operating condition at a bargain price, \$3450.
- $\frac{1}{2}$ yd Byers Model 66 crane, backhoe and fairleads. Condition good, \$5900.

$\frac{1}{2}$ yd P&H Model 200. Fair condition. \$2200.

$\frac{1}{2}$ yd Bay City Model 16B—2 skimmer buckets and backhoe—half revolving. \$1600.

A 1941 $\frac{1}{2}$ yd Byers Model 83 backhoe, shovel and dragline combination—rebuilt and guaranteed.

A 1939 Marion Model 331 backhoe and shovel combination— $\frac{3}{4}$ yd capacity—rebuilt and guaranteed. Keystone $\frac{1}{2}$ yd excavator \$1750.

Lorain Model 46 shovel and dragline combination— $\frac{3}{4}$ yd capacity.

$\frac{3}{4}$ yd Northwest Model 3 shovel and dragline—exceptionally good buy for \$6450.

$\frac{3}{4}$ yd P&H combination shovel and crane with fairleads—entirely rebuilt and guaranteed. Price \$6300.

1 yd Byers serial number in the 3800s with 66' boom—powered by Hercules. Price nominal—only \$4490.

1 yd Late model Koehring Type 376—entirely rebuilt top to bottom. Price \$8750 which is way under its market value.

$1\frac{1}{2}$ yd Link-Belt 1935 or 1938 model, 65' dragline boom, shovel attachments. Light weight Page bucket. \$8400.

5 YD. SHOVEL

1943 P & H Model 1500

Electric Shovel in Excellent Condition.
34' shovel boom, 22 $\frac{1}{2}$ ' dipper stick, 5 cu. yd. dipper bucket and electric cables go with the equipment.

Write, phone or wire for further information.

One $\frac{1}{2}$ yd. P&H Model 300A shovel and dragline combination excellent condition. Rebuilt and guaranteed. Real buy for \$5300.00.

$\frac{3}{4}$ yd Northwest Model 25 backhoe and dragline combination. Built in 1939.

$\frac{3}{4}$ yd Northwest Model 105. An old unit but still in good operating condition with Climax 4-cylinder engine. \$4850.

$\frac{3}{4}$ yd P&H Model 294 dragline, 35' boom, \$4000.

$\frac{3}{4}$ yd P&H 206, \$2900, including bucket.

$\frac{3}{4}$ yd P&H 400 Shovel, \$4750.

1 yd Bucyrus-Erie 30B Diesel crane, powered by Atlas Diesel Engine. An old model but still a good buy.

1 yd Lorain 60A shovel and dragline combination. Entirely rebuilt.

1 yd Lorain Model L55 in exceptionally good condition.

Two 1 yd Koehring Model 301.

1 yd Northwest Model 101 in fair condition, \$3300.

1 yd Diesel Osgood shovel and dragline. Caterpillar Diesel Engine. Unit is in good condition. \$9400.

$1\frac{1}{2}$ yd Byers Shovel and Dragline combination. Good condition. Price exceedingly low, \$7900.

$1\frac{1}{2}$ yd Lima Model 101 shovel and dragline combination. Price reasonable.

$1\frac{1}{2}$ yd Lorain 73A shovel. \$9450.

A rebuilt Lorain 75B shovel, crane and dragline combination. \$11,900 with 60 day rebuilt guarantee.

$1\frac{1}{2}$ yd Northwest Model 4 in real good condition and very reasonably priced.

$1\frac{1}{2}$ yd Northwest Model 6 shovel and dragline combination, with rebuilt guarantee.

1— $\frac{1}{2}$ yd Osgood shovel.

1— $\frac{1}{2}$ yd P&H Model 700B shovel and dragline combination 60' boom, \$7400.

1— $\frac{1}{2}$ yd Bucyrus-Erie 37B shovel. One of the best buys we know of, \$11,300.

1— $\frac{1}{2}$ yd P&H Model 700B shovel and crane combination, price \$7300.

1— $\frac{1}{2}$ yd Koehring 501A shovel. Needs certain amount of repairs. Price way under its value, \$7700.

1— $\frac{1}{2}$ yd Koehring shovel Model 502—Caterpillar diesel engine. Reasonably priced.

1— $\frac{1}{2}$ yd Lorain Model 77 shovel and dragline combination—45' dragline boom—rebuilt and guaranteed.

2 yd Bucyrus-Erie diesel shovel and dragline combination—needs a certain amount of work, \$12,250.

1— $\frac{3}{4}$ yd Koehring 701 shovel and crane, powered by Caterpillar 13,000 diesel engine.

2 yd P&H Model 786 diesel dragline—75' boom.

2 yd Page dragline—66' boom—Page diesel engine.

2 $\frac{1}{2}$ yd Bucyrus-Monighan walking dragline diesel powered 62' boom.

3 yd Monighan diesel 66' boom—Fairbanks-Morse diesel engine—condition good.

2 yd Bucyrus-Erie 43B electric tunnel shovels.

2 yd Bucyrus-Erie 50B electric shovel.

4 yd 120B Bucyrus-Erie electric shovel.

Two 3 yd Marion electric shovels, Model 125.

7 yd Bucyrus-Erie electric shovel.

This is only a partial list of shovels, cranes we offer for sale.

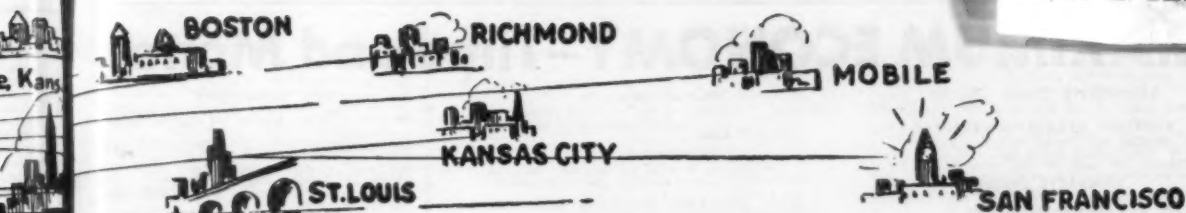
We suggest you wire or telephone immediately for a summarized proposal.

Steam shovels from $\frac{1}{2}$ yd up to 8 yds.

Description will be sent upon request.

ECONOMY COMPANY INC

NEW YORK



es Are Buzzing for "ECONOMY"

TOURNAPULLS

- 6 Super C Tournapulls, 1942 Models, Maryland, \$10,200.00 each.
- 3 Super C Tournapulls, rebuilt, West Coast, \$10,300.00 each.
- 5 Model A 23 yd Tournapulls. A great bargain. Minnesota, \$11,200.00 each.
- 2 Model C Tournapulls, \$5300.00 each.

DUMP TRUCKS

- 4—Sterling 7½ ton 1940 Models, 10.50x24 tires, excellent condition, \$4950.00 each.
 - 1—1941 Sterling 7½ tons, 11.00x24 tires, \$5500.00 each.
 - 3—1941 Ford dump trucks, \$1375.00 each.
 - 3—Euclid 10 yd trucks with Cummins diesel engines, tire size 18.00x24, \$5900.00 each.
 - 3—20 yd Maxi two way side dump trucks—price upon request.
 - 10—10 yd Euclid gas dump trucks, \$4300.00 each.
- We can offer several other dump trucks and Complete listings on small and large diesel and gas dump trucks and semi-trailers will be sent upon request.

SPECIAL

- 1—Diamond No. 35 Rotor Lift Vibrator Gravel Crushing and Screening Plant, equipped with dual pneumatic tires. Engine R0D8-20 Model No. 35-5C6 Heavy Duty motor, radiator, pulley and parts completely installed. Extra screens, belts, etc. Powered by gas.

Attractively priced, which will be given upon request.

TRAILERS

- 4—Athey trailers with Linn tractors, late models, excellent condition, New England.
 - 1—35 ton Williams trailer with 12 large pneumatic tires, rebuilt, \$3900.00; \$1000.00 under selling.
 - 1—50 ton trailer with double drive Autocon, exceptionally good condition. Price upon request.
 - 1—15 ton shovel trailer, 6 pneumatic tires 40x8, mechanical brakes, excellent condition, \$980.00.
 - 1—1941 Freuhauf 14' dump semi-trailer 18½ yd capacity, excellent condition, \$3900.00.
- 10 other small and large trailers, description will be sent upon request.

TRACTORS

- 4—International TD-18 tractors with hydraulic bulldozers, rebuilt and guaranteed condition, \$6700.00 each.
- 1—D-8 Caterpillar Tractor with LeTourneau Angle-dozzer and 12 yd LeTourneau scraper and other accessories, \$12,350.00.
- 1—RD-8 tractor with bulldozer, double drum power unit, 12 yd scraper, \$12,250.00.
- 1—D-8 Tractor with down pressure hydraulic bulldozer, serial 963546, \$4700.
- 1—Caterpillar 60 Tractor with Bulldozer, 18' blade, \$1950.00.
- 1—Model 4 Caterpillar Tractor with LaPlant Cheate brand new hydraulic bulldozer, \$3900.
- 1—R-2 Caterpillar Tractor with LaPlant Cheate Bulldozer, \$2100.

TRUCK CRANES

- 1—Quickway Shovel and Crane Combination, 35' boom, 1000x24 brand new pneumatic tires, 6 ton capacity.
- 1—P&H Model 300—8-10 tons, 10 wheeler AC Mack truck, 1100x24 Budd wheels. Rebuilt guarantee.
- 1—Universal crane in excellent rebuilt condition on 10 wheeler Hendrickson truck, large tires.
- 1—P&H Model 203—7 to 9 tons, 6 wheels 900x24, 45' boom, \$7600.00, a real bargain.
- 1—Spencer truck crane, 7½ tons, 25' boom, mounted on White Truck, \$3900.
- 1—15 ton Byers truck crane on 10 wheeler, specially constructed Mack truck, 65' boom, rebuilt and guaranteed.
- 1—Lorain 40—12 to 15 tons, 70' boom, 10 wheeler, special Mack chassis 1100x24 tires, \$11,800.00.

BUCKETS

- 1—½ yd Orange Peel bucket—rebuilt and guaranteed, \$225.
 - 1—1 yd Blawnox single line bucket, \$620.00.
 - 1—¾ yd Kinsler clamshell bucket, rebuilt, \$495.
 - 1—½ yd Williams clamshell digging bucket, very good condition, \$435.00.
 - 1—½ yd Page dragline bucket.
 - 1—½ yd Owens clamshell digging bucket.
 - 1—¾ yd Owens clamshell bucket.
 - 1—1 yd Hayward clamshell bucket.
 - 1—1½ yd Page clamshell bucket.
 - 1—Haise ½ yd rebuilt dragline bucket.
 - 1—1½ yd Page dragline bucket.
 - 1—2 yd Page dragline bucket.
 - 1—Owens 5 yd clamshell bucket.
- Additional listing on buckets—over 110 in all will be gladly sent upon request.

2½ yd. Diesel Shovel and Dragline. Built in 1938—Bucyrus-Erie 48B 60' dragline boom, complete shovel attachment.

Exceptional buy.

Phone at once if interested.

**SHOVELS
TRUCK CRANES
TRACTORS
DUMP TRUCKS
BUCKETS
OVERHEAD CRANES
LOCOMOTIVE CRANES
MIXERS
TRAILERS
CRANE ATTACHMENTS
GRADERS
BULLDOZERS**

Complete listing on each of these items will be forwarded promptly on request.

A 6-YARD DIESEL MONIGHAN 5W with 150' dragline boom. Phone for further information.

NEW YORK 9-A Vanderbilt Ave., N.Y.C.

TELS. MURRAY HILL
4-2294, 4-2295,
4-2296, 4-2893,
4-2844, 4-8292

— FOR SALE —

MAXIMUM ECONOMY—Time and Money

LOCOMOTIVE TRACK CRANES

2—Std. gauge, 25 ton Browning, shop overhauled.

GYRATORY REDUCTION CRUSHERS

- 1—3/4 Symons with coarse bowl.
- 1—5/4 Symons with coarse bowl.
- 1—Traylor, bell head, 10" feed opening.

BRIQUETTE PRESSES

- 2—Komarek-Greaves 25" dia. x 34" face, rated 25 l.p.h. with extra shafts and rolls.

ROTARY KILNS

- 3—5'x40', 5'x48', 6'x50', all made by Vulcan Iron Works. Equipped with firing hoods, complete.
- 1—6'x60'.
- 1—8'x135' Allis-Chalmers, with 6'x40' rotary cooler.

DIRECT HEAT ROTARY DRYERS

- 2—5'x40'.
- 1—5'x30' Cummer, mounted on steel I-beam frame, with furnace, etc.
- 2—6'x30' Ruesler-Cole, double shell.
- 1—6'x60' Allis-Chalmers "Ebro" type, single shell.

HARDINGE CONICAL BALL AND PEBBLE MILLS

- 2—4'x16" and 6'x22" iron lined.
- 1—5'x22" iron lined, silent chain drive.
- 1—6'x30" silex lined, silent chain drive and motor.
- 2—8'x30" silex lined, belt driven.

DORR CLASSIFIERS

- 2—Dorr Combination Bowl & Rake Classifiers, 10' dia. with 2'3"x19" rake and 12' dia. with 2'3"x11'4" rake.

RAYMOND MILLS

- 1—4 roll High Side, with air classifier, Raymond exhaust, cyclone collector and inter-connecting piping.
- 1—4 roll High Side, equipped with whizzer air classifier, Raymond exhaust, cyclone collector, connecting piping, etc.

CRUSHING ROLLS

- 1—24"x40" Pennsylvania, single roll.
- 3—18"x18" Jeffrey, single roll.
- 2—40"x16" double roll, smooth shells.



CONSOLIDATED PRODUCTS COMPANY, INC.

15-16-17 PARK ROW

NEW YORK, N. Y.

Shops and Yard at Newark, N. J., cover eight acres.

BELT CONVEYORS

- 1—30'x24' long, heavy steel frame, semi-portable.
- 1—30'x120' c/c, Rex-Stearns anti-friction idlers; steel frame.
- 1—30' approx. 500' c/c with Jeffrey anti-friction idlers, gear reducer, motor, take-up, etc.
- 2—Belt Feeders, steel frames, 24"x6'.
- 1—Robins 24" Reciprocating Fan Feeder.
- 2—Portable Belt Conveyors, 16'x25'; 16'x35', electric motor driven.

VIBRATING SCREENS

- 2—Tyler Hummer, 3'x5', 4'x5'; one and two decks; also spare V-32 vibrators.
- 1—4'x10' Robins, 2-deck.
- 1—3'x8' Allis-Chalmers, 3-deck, UNUSED.
- 1—4'x8' Huron, 1-deck.
- 1—4'x12' Symons, 3-deck.

SHOVELS

- 1—1 yd. P. & H. Shovel, gasoline, fitted with new crawler tracks.
- 1—Marion 37 electric, 1 1/2 yd., with Ward-Leonard control.

SHOVELS—CRANES

- Marion 1 1/2 yd. Shovel & Crane, 65' hm., gas.
- Lorain 75B shovel and crane, 1 1/2 yds.
- Lorain 75A shovel and crane, 1 1/2 yds.
- P & H 700 Shovel and Crane, 1 1/2 yds.
- P & H 650 Combination Shovel-Crane, 1 1/2 yds.
- Northwest No. 6 Shovel-Crane-Drill.
- P & H 600 Shovel, gas.
- P & H 283A, 5 ton Truck Crane.
- Browning 10 ton Truck Crane on Mack truck.
- Bucyrus-Erie 50B 2 yd. Diesel Drill.
- Bucyrus-Erie 50B Steam Shovel, High lift.
- Buc-Erie 20B, 1 yd. Electric Tunnel Shovel.
- Buc-Erie GA2 Shovel, gas.
- Thew-Universal Model 35 Shovel-Crane.
- Michigan Truck Crane, 5-ton cap.
- Page Walker 3 yd. Dragline, Diesel.
- Lorain 75B 1 1/2 yd. shovel, crane.
- Hyers Bear Cat 1/2 revolving crane, 5 ton cap.
- Oris Edgwood, 1 yd. crane on wheels.

TRACTORS AND MISCELLANEOUS

- Cat. B.D.7 Tractor angledozer.
- Cat. B.D.4 Tractor angledozer.
- Int. T65 Tractor with bulldozer.
- Int. TD14 Tractor with bulldozer, rebuilt.
- Int. & D.18 Tractor angledozer.
- Allis-Chalmers H.D.14 with Baker bulldozer.
- Allis-Chalmers K Tractor with bulldozer.
- Allis-Chalmers HD10 Tractor with bulldozer.
- Buckley Elevator, vertical, 35', 22' buckets.
- B.R. 12 ton, 3 wheel Roller, gas.
- B.R. 10 ton, 3 wheel Roller, steam.
- Galion 10 ton, 3 wheel Roller.
- 5 Brockway 7-ton Dump Trucks.
- 4 Federal 3-yd. Dump Trucks.
- 1 Sterling 3-yd. Dump Truck.
- Worthington 8' cent. Brons impeller, elec. port.
- Allis-Chalmers Cent. Pump, electric, 3500 GPM.
- 3 Sterling Diesel Pump Trucks, 12 yds.

CONCRETE PLANT AND EQUIPMENT

- Complete Ready Mix Concrete plants.
- Transit Truck Mixers from 2 yds. to 5 yds.
- Besser Super Tamping concrete Block Machine.
- 2—Ransome 25B Mixers on skids, left & right-hd.
- Johnson 200 yd. Octo Bin, 4 comp.
- Fuller Klaxon Bulk Cement Unloader, portable.
- Fuller C10 Rotary Air Compressor, electric.
- Koehring 342E Dual Drum Paver.
- Pavers: 2—Koehring, 1—Mullifoot, 1—Rex 27E.
- Rex Pumperete—Models 180, 190, 200.
- Flex-plane Finisher, 10'-15' up to 32'.

CRUSHERS—CRUSHER PLANTS

- Roll: 54x24, 54x36, 50x24.
- Telsmith 20B steel frame Gyratory, V-belt drive.
- Gyratory Crusher: K.V. 8, 50, 37, 49; 22, 24, 28, 30; Traylor 20; McCully 12, 8, 6.
- Allis-Chalmers Anaconda Type, 54"x24".
- Roll: 6x12, 9x16, 10x20, 14x24, 12x26, 13x30, 16x32, 24x50.
- Complete Rock Crushing, Sand and Gravel Plants.

BUCKETS—STONE SKIPS

- Owen 1 yd. Clamshell, rehandling.
- Blaw-Knox 3/4 yd. Clam, digging.
- Hayward 3/4 yd. Clam, digging.
- 3/4 yd. Williams Clamshell, digging.
- 3/4 yd. Hales Clamshell, rehandling.
- 3/4 yd. Hales Clamshell, rehandling.
- Erie 3/4 yd. Clamshell, rehandling.
- Owen Stone Grapple.
- Hayward 3/4 yd. Standard Orange Peel.

LOCOMOTIVES—CARS

- American 45-ton, steam, Saddle Tank.
- Plymouth 36-ton, gas, std. gauge.
- Vulcan 30-ton, steam, Saddle Tank.
- Vulcan 25-ton, steam, side saddle loco.
- Whitcomb 30-ton, std. ga. gas loco.
- Whitcomb 14-ton Diesel, 36" gauge.
- Vulcan 8-ton, std. gauge, gas.
- Vulcan 5-ton, gas, 36" gauge.
- Porter 12-ton, Saddle Tank, steam, 36" gauge.
- 3—Western Steel, 30 yd. Air Dump Cars.

RICHARD P. WALSH CO. • 30 Church St. • New York

- 1—50x24 Champion Crusher
- 1—36x24 Farrel Crusher
- 1—36x18 Farrel Crusher
- 1—12x24 Champion Crusher
- 1—9x18 Climax Crusher on wheels
- 1—13A Telsmith Gyratory Crusher
- 3—Steel, practically new, Lewis Foundry Machine Co. Worm Washers, 30" diameter, 14' long
- 1—Double Drum Hoist with a 50 HP Novo Gasoline Engine directly connected—all on 1 cast iron base
- 1—50' lattice boom—from an Osgood Shovel
- 1—30" bucket elevator, 12 ply Robbins Belt, 66' center
- 2—Complete 30" belt conveyors, 1—128' center, 1—145' center
- 2—Complete 24" belt conveyors, 1—120' center, 1—160' center
- 1—18" complete belt conveyor, 68' center
- 1—practically brand new 75 HP G. E. Slipring Motor, 1200 RPM, 220 or 440 volt, 60 cycle, 3 phase
- 1—90 HP Wagner Slipring Motor, 690 RPM, 220 or 440 volt, 60 cycle, 3 phase
- 1—Lot of small motors from 5-50 HP

FRANK A. KREMER & SONS, INC.

R. D. No. 2, Reading, Pa.

Phone: Leesport 100

Night Phone: Philadelphia: HANCOCK 7959

FOR SALE

- 2—Caterpillar Diesel Electric Sets, 17-858 with D-17000 Engine, 220-440 Volt, A.C. 60 cycle, 3 Phase, self-regulating generators. (Practically new)
- 1—280 H.P. 220-440 Volt, 60 cycle, 3 Phase Slipring Motor with grids.
- 1—75 H.P. 750 R.P.M. 220-440 Volt, 60 cycle, 3 Phase slipring motor with grids, drum, switch and relay.
- 1—100 H.P. 985 R.P.M. 440 Volt, 60 cycle, 3 phase, slipring with grids, drum, switch and relay.
- 1—15 H.P. 1745 R.P.M. 220-440 Volt, 60 cycle, 3 phase, ball bearing induction motor with cross line magnetic starter. (New.)
- 1—7 1/2 H.P. fully enclosed, fan cooled, ball bearing induction motor, 220-440 Volt, 60 cycle, 3 phase.
- 1—75 H.P. 990 R.P.M. 220-440 Volt, 60 cycle, 3 phase induction motor with starter.
- 1—445 Cu. Ft. Worthington Electric Compressor, 2 stage.
- 300' 3" Black pipe.
- 200' 600 Volt—400 AMP. 3 wire rubber covered cable.
- 200' 600 Volt—200 AMP. 3 wire rubber covered cable.
- 900' 600 Volt—200 AMP. single copper cable.

Write Box C-24, c/o Rock Products,

309 W. Jackson Blvd., Chicago 6, Ill.

CRUSHER—JAW

- 1—Traylor 36x42 with or without Pan Feeder.

CRUSHER—REDUCTION

- 1—Traylor 4 ft., type T.Y.

DIESEL MOTORS

- 2—Cummins 200 H.P., supercharged Diesel Motors for use in Euclid and other similar heavy trucks.

PAN FEEDER & CONVEYOR

- 1—Pan Feeder 48x16 ft.
- 1—Pan Conveyor 24x65 ft.

HAMMER MILL

- 1—Dixie Mogul Breaker Plate type, size 5024, hopper opening 24x24.

LOCOMOTIVES

- 1—Lima 80 ton, 6 wheel, Switcher with piston valve, with tender, superheater, code boiler, 200 lbs. pressure, electric lights, Walschaert valve motion, automatic lubrication; thoroughly modern, excellent condition, immediate delivery. For sale or rent.
- 1—Baldwin and 1—American, 6 wheel, Switchers with tenders, 70 and 80 tons capacity, ASME code boilers.
- 1—35 ton and 1—25 ton, gas, standard gauge, air brakes, thoroughly modern.
- 1—Milwaukee 12 ton, gas, standard gauge.

MINE HOIST

- 1—Allis-Chalmers, single drum, 600 H.P., A.C., 2300 volt, drum 34"x118" face, 2550 ft. 1 1/2" rope, operating in balance, with all modern safety features.

PUMPS

- 1—Two stage centrifugal, high speed, ball bearing, direct to 350 H.P., 2500 volt, 3 phase, 60 cycle, cap. 1070 GPM @ 1900 ft. with across-the-line starters.

VIBRATOR SCREEN

- 1—Traylor FB-4 size 47"x54" with generator.

SHOVELS & DRAGLINE

- 1—Marion 4 yd. Electric, model 4160, full reversing, gravity tread, Ward Leonard control equipment, late type crawlers; perfect condition. Located in Minnesota.
- 1—4 yd. Electric Shovel with 3 yd. dragline equipment, Ward Leonard control, 100' boom.

TRUCKS

- 4—Euclid 18FD, end dump, 15 tons capacity, 200 H.P. Cummins, supercharged diesel motors, guaranteed condition.

LOG TYPE STONE WASHER

- 1—Allis-Chalmers 25', heavy duty, batch type, Log Washer, with steel tank, 3/4" plate, with two logs with paddles, 35" dia.

WELL DRILL

- 1—Armstrong 25-T electric, crawler mounted, 220/440 volt, complete with cable tools, etc.

JAW CRUSHERS, GYRATORY CRUSHERS, ROLL CRUSHERS, DRYERS & KILNS, HOIST, CARS, CRANES, SHOVELS, ETC. WE WILL BUY ANY MODERN PIECE OF EQUIPMENT ANYWHERE.

A. J. O'NEILL

Lansdowne Theatre Bldg.

LANSDOWNE, PA.

Phila. Phone: Madison 8300

OFFICES and PLANTS

CHICAGO 12 NEW YORK 7

1119 S. Washington Ave. 30 Church St. Dept. RP

PITTSBURGH 30 PHILADELPHIA 2

P. O. Box No. 933 1311 Race St.

Dept. RP

EQUIPMENT CORPORATION
of **AMERICA**

WE SERVE 4 WAYS

BUY REBUILD

SELL RENT

FOR SALE

CRUSHERS

GYRATORY: 42" Gates K. 30" Superior McCully (like new). 20" Superior McCully Gates Nos. 12, 10, 9, 8, 7 1/2, 6, 5, 4, 3, 2, 1 (75 avail.). Teismith Nos. 4, 5, 6, 8C, 9 & 16. Also many Austins, Kennedys and Trailors, many sizes.

JAW TYPE: Trailor 60x24, 48x20, 42x18, 24x12, Superior 24x18 & 24x36. Buchanan 30x12. Farrel 60x24, 30x20, 24x18, 18x12, 12x24. Good Roads 1030. Ames 24x18. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 12x36.

REDUC. TYPE: Kennedy Nos. 25, 27 & 49. Teismith 2-F & 40. Trailor 30" T2, 5", 10", 12". Super. McCully 9" 110". Newhouse 5, 7, & 10". Symons Cone & Disc Ty. 2' to 4'.

ROLLS: Allis-C. 12 1/2x12, 26x10, 40x15, 54x24 & 72x30. Fairmount 36x20 & Jeffrey 24x24 to 36x24 single roll. Cornish 26x14 & 42x16, Etc.

HAMMERMILLS: Williams No. 1, 2, 3, 4, 5, & 9. Jeffrey 26x18 & 36x24. Day Nos. 20 & 40. Etc.

MILLS: Kennedy Ball 4x3, 5x2 & 5x3. Marcy 8x8 & 10x9. Hardings 6'x3", 8'x30" & 6'x9". Misc. Tube Mills 5' & 6'x22". Sturtevant Ring Roll, Raymond, Kents, Fuller, Lehigh, Etc.

CRUSHING PLANTS: No. 65 Diamond No. 22 Pioneer 8x24, 10x30 Good Roads, 8x10 Austin-Western, 9x36 C.R.

MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Rollers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derrick, Elevators, Excavators, Generators, Hoists, Kilns, Draglines, Drag Scrapers, Dredges, Drills, Engines, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Shovelers, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

ALEXANDER T. McLEOD

7229 Rogers Avenue CHICAGO (45)

LOCOMOTIVES

- 1-20-ton Plymouth standard gauge gasoline.
- 1-20-ton Whitcomb diesel 36" gauge.
- 1-57-ton Baldwin type 0-6-0 standard gauge saddle tank.
- 2-67-ton American type 0-6-0 standard gauge separate tenders.
- 2-78-ton Baldwin type 0-6-0 standard gauge side tanks.

B. M. WEISS COMPANY

Girard Trust Co. Bldg., Philadelphia 2, Pa.

BUSINESS OPPORTUNITIES

WHITE TALC AND MARBLE

Fourteen acres containing excellent marble and white talc, located in Cherokee County, North Carolina, main highway. Drill records and cores available. Quick sale at sacrifice price.

W. B. HARTSFIELD

501 Grant Bldg. Atlanta, Ga.

FOR SALE ALL OR IN PART

Sand and Gravel Plant, including Jaw Crusher, Gyratory Crusher, Conveyors, Vibrating Screens, Sand Classifiers, Extra Heavy Scrubber, Water Pumps, Sand Pumps, Feed-O-Weights, Weightometers, Trestle and Tripper and Auxiliary Equipment.

ALSO

Approximately 9 miles of Conveyor, complete with belting, pulleys, roughing and return idlers and drive equipment.

All offered subject to prior sale.

For Particulars Write

COLUMBIA CONSTRUCTION CO., INC.
Box 579, Redding, California
Telephone Redding 1440

BUSINESS OPPORTUNITIES Cont'd

SELL OR RENT—IMMEDIATE DELIVERY

10x20 Universal Rock Crushing Plant with E60 Allis-Chalmers Power Unit—Pulverizers—Rock Drills—Air Hose—Leflo Air Compressors 1650 to 3150, 2 and 4 pneumatic wheels, late type.

FALLS CITY SALES COMPANY

148 N. Clay Street, Louisville, Ky.
Phone: Jackson 0189

EQUIPMENT WANTED

AIR COMPRESSOR WANTED

Will Pay Cash for 2600 Ft. Cap. or 2—900 to 1300 Ft. Electric or Diesel Driven Air Compressors.

Write Box C-25, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

WANTED TO BUY

Off bearer hoists, 12' boom, to carry up to 500 pounds.

W. N. RUSSELL & COMPANY

34-60 Albertson Avenue
Westmont, N. J.

WANTED

Two High Pressure Steam Kilns. Preferred with quick opening door or doors. Must be in excellent shape and pass inspection.

JAKRA DUNBRIK MFG. COMPANY
P. O. Box 1556 Roanoke, Va.

CEMENT COLORS

TAMMS CEMENT COLORS

Permanent—Acid Free—Limeproof
Wide range of colors.

Also Marble and Granite
Aggregates.

Write us for Samples and Prices:

TAMMS SILICA COMPANY
228 N. La Salle St. Chicago, Ill.

MINERAL COLORS

CEMENT-PLASTER-STUCCO CONCRETE PRODUCTS

"FINE BECAUSE OF THEIR FINENESS"

Ask us for samples and recommendations
BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

CONSULTING ENGINEERS



CORE DRILLING ANYWHERE

We look into the earth
PENNSYLVANIA
DRILLING COMPANY
Pittsburgh, Pa.

H. D. RUHM

Consulting Engineer PHOSPHATE

305 W. Seventh St.

Columbia

Tenn.

Quarries
Crushing Plants
Cement Plants
Storage Methods
Operating Costs

E. LEE HEIDENREICH, JR.

Consulting Engineer

Route No. 1, Newburgh, N. Y.

Phone 3677-M

Operation
Plant Layout
Design
Construction
Appraisals

POSITIONS WANTED

POSITION WANTED

College Graduate, Civil and Mechanical Engineer, CE and MEED Degree. Fifteen years' experience as quarry Superintendent and Production Manager operating large quarry, Ready Mix Concrete plant and Building Material Warehouse.

Would like post-war position with permanent future. Available in thirty days, age 39, married and settled. Write Box C-1, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED

Assistant Chief Chemist in one of the most up-to-date plants in the country desires position of a supervisory nature in firm with good opportunity for advancement. Eighteen years of experience in cement manufacture. Recently released from the Army under the Voluntary Retirement plan with rank of major. Two-and-one-half years of the three-and-one-half in the Army were in technical research and plant management. Write Box C-16, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED as Superintendent of concrete aggregate plant operations with 15 years' experience in plant, pit and quarry operations. Experienced in construction and operation. Several years supervising operations on large dams, aqueducts and mining. Available after Feb. 15th. Now employed as mechanical superintendent for largest U. S. mining operations in Nicaragua. Speak Spanish, married, no children, can travel, have a good technical education, age 40 years. Write Box C-20, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

MANAGER - SUPERINTENDENT, 25 Years' experience NON-METALLIC MINERAL, MINING AND REFINING (Phosphate, Feldspar, Mica, Kaolin, Talc, Garnet, Potash Sands) with **CHEMICAL PROCESSING** technical background. Complete Supervision, Cost Control, Operation, Maintenance, Planning, Construction, Purchasing and Personnel. Permanent only. \$6000. 48 years old, married. Seaboard preferred, but will go anywhere. Write Box C-22, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED — As Southern sales representative of reliable firm manufacturing complete line of cement building units machinery. Can give part or full time now if I get full assurance of having something to offer when restrictions are lifted. Age 45. Twenty years selling experience, 15 years with one firm. References. Write Box C-23, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITIONS VACANT

WANTED

Gravel Plant Superintendent. Competent to take full charge. Connecticut. Write Box C-21, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

WANTED PLANT SUPERINTENDENT

Familiar with pipe, block or any special concrete product. Must have at least high school education, be mechanically inclined and have pleasing personality. Age limit 45. Post-war opportunity with large concern branching out into full line of products in various sections of the United States and operating on an incentive profit sharing plan. Past record must stand rigid inspection. Include photograph in reply. Write Box C-15, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

NEW LEADER Truck Body Type LIME SPREADERS

Can Now Be Purchased Without Triple AAA
Certificates or Priority



THE above picture shows a rear view of the new model NEW LEADER marl and lime spreader. This spreader is equipped with an extra wide conveyor and two distributor discs and is strictly a one-man spreader. You will be able to haul wet lime or marl and, due to the large opening in the back end of the spreader, material will always feed onto the distributor disc evenly.

This spreader has many outstanding features. Both gear boxes driving the distributor discs are equipped with cut steel gears and ball-bearings running in a dust-proof and oil-tight gear case. The large gear box driving the wide chain conveyor is equipped with a steel ring gear and pinion and a thrust bearing also running in a dust-proof and oil-tight gear case. Bearing hangers are placed underneath the distributor discs; these are also equipped with ball bearings. This helps to carry the weight of the distributor discs and the load, the weight not being suspended from the gears in the small gear box. With this arrangement you are assured longer lived gears. The framework of the spreader is of hardwood.

These spreaders can now be purchased without priority or certificates of any kind. Write us for any additional information, also prices.

Write today for latest catalog

HIGHWAY EQUIPMENT COMPANY, INC.

Manufacturers of the World's Most Complete Line of Spreaders, Including Lime Spreaders, Sand and Cinder Spreaders, Chip Rock, Clay and Dirt Spreaders.

CEDAR RAPIDS, IOWA, U. S. A.

Phone 32017-32018

INDEX TO ADVERTISERS

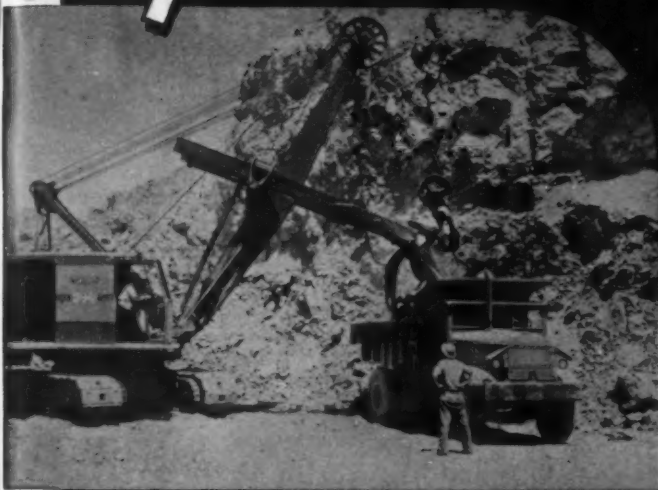
Allis-Chalmers Mfg. Co.	10, 11	Johnson, C. S., Co.	28
American Brake Shoe Co.	101	Johnston Iron Works	118
American Cable Div.			
..... Inside Back Cover		Kennedy-Van Saun Mfg. & Eng. Corp.	18, 19
American Chain & Cable Co., Inc.	..... Inside Back Cover	Kensington Steel Co.	120
American Manganese Steel Div.	..... 101	Kent Machine Co.	119
American Pulverizer Co.	124	Kimbalton Lime Co., Inc.	137
American Zinc Co. of Tennessee	137	Knox Mfg. Co.	125
Anchor Concrete Machy. Co.	118	Koehring Co.	37
		Kremsner & Son, Frank A.	140
Babcock & Wilcox Co.	50		
Bacon, Earle C., Inc.	128	LaPlant-Choate Mfg. Co., Inc.	2
Barber-Greene Co.	87	Laughlin, Thomas, Co.	105
Baughman Mfg. Co.	127	Lee Rubber & Tire Corp.	70
Bemis Bro. Bag Co.	80, 81	Leschen, A., & Sons Rope Co.	128
Besser Mfg. Co.	110, 111	Le Tourneau, R. G., Inc.	37
Birmingham Rail & Locomotive Co.	137	Link-Belt Co.	123
Blaw-Knox Co.	131	Ludlow-Saylor Wire Co.	38
Boston Woven Hose & Rubber Co.	75		
Bradley Pulverizer Co.	133	McLanahan & Stone Corp.	130
Brill Equipment Co.	135	McLeod, Alexander T.	141
Broderick & Bascom Rope Co.	127	Machin, E. C., Co.	121
Brooks Equipment & Mfg. Co.	2	Mack Trucks, Inc.	122
Buckeye Traction Ditcher Co.	42	Macwhyte Co.	122
Bucyrus-Erie Co.		Mid-Continent Equipment Co.	135
..... Outside Back Cover		Mine & Smelter Supply Co.	100
Buell Engineering Co., Inc.	48	Mine Safety Appliances Co.	126
		Multiplex Concrete Machy. Co.	117
Carlyle Rubber Co., Inc.	136		
Caterpillar Tractor Co.	23	National Supply Co.	8
Chain Belt Co.	32	Naylor Pipe Co.	103
Chicago Perforating Co.	130	Neff & Fry Co.	133
Chicago Steel Foundry Co.	121	New England Lime Co.	135
Classified Advertising	135-141	New Holland Machine Co.	125
Cleveland Rock Drill Co.	36	Nordberg Mfg. Co.	141
Cleveland Wire Cloth & Mfg. Co.	131	Northwest Engineering Co.	5
Colorado Iron Works Co.	34		
Columbia Construction Co., Inc.	141	O'Neill, A. J.	140
Combustion Engineering Co., Inc.	15	Owen Bucket Co.	131
Consolidated Products Co., Inc.	140		
		Pennsylvania Crusher Co.	131
Davenport-Bessler Corp.	132	Pioneer Engineering Works	85
Denver Equipment Co.	134	Plymouth Locomotive Wks.	134
Dorr Co.	29		
		Quaker Rubber Corp.	17
Easton Car & Construction Co.	43	Quinn Wire & Iron Works	118
Economy Co., Inc.	138, 139		
Ensign-Bickford Co.	128	Raymond Pulv. Div.	15
Equipment Corp. of America	137, 140	Republic Rubber Div.	70
Erie Steel Construction Co.	133	Robins Conveyors, Inc.	46
Euclid Road Machinery Co.	143	Roebbling's John A., Sons Co.	41
Fate-Root-Heath Co.	134	St. Regis Paper Co.	77
Ford Motor Co.	38	Saunders Brothers, Inc.	123
Frog, Switch & Mfg. Co.	133	Scientific Concrete Service Corp.	134
Fuller Co.	26	Simplicity Engineering Co.	98
		Sinclair Refining Co., Inc.	98
Gar Wood Industries, Inc.	16	Sly, W. W., Mfg. Co.	69
Gates Rubber Co.	30	Smith, F. L., & Co.	73
General Electric Co.	20, 21	Smith Engineering Works	91
General Excavator Co.	25	Smith, H. Y., Co.	136
Goodrich, B. F., Co.	1	Stanhope, R. C., Inc.	136
Goodyear Tire & Rubber Co.	9	Stearns & Wilton Co.	136
Great American Industries, Inc.	14	Stearns Mfg. Co.	106
Gruender Crusher & Pulv. Co.	129	Steady Co.	4
Gulf Oil Corp.	72	Sturtevant Mill Co.	83
		Swabb, Frank, Equipment Co.	135
Hammond Bag & Paper Co.	128	Synton Co.	123
Hardinge Co., Inc.	104		
Harnischfeger Corp.	40	Taylor Forge & Pipe Works	31
Harrington & King Perf. Co.	132	Texas Co.	32
Hartsfield, Wm. B.	141	Thew Shovel Co.	3
Hayward Co.	130	Timken Roller Bearing Co.	4
Heldreich, Jr., E. Lee	141	Traylor Engineering & Mfg. Co.	7
Heltzel Steel Form & Iron Co.	93	Trojan Powder Co.	90
Hendrick Mfg. Co.	129	Truck Equipment Co., Inc.	135
Hercules Powder Co.	33	Twin City Iron & Wire Co.	135
Hercules Steel Products	102	Tyler, W. S., Co.	126
Highway Equipment Co., Inc.	142		
		Universal Engineering Corp.	79
Industrial Brownholst Corp.	124	Universal Vibrating Screen Co.	134
Industrial Gear Mfg. Co.	122	Unverzagt, G. A., & Son	137
Iowa Mfg. Co.	45		
		Van Der Horst Corp. of America	24
Jaeger Machine Co.	129	Vulcan Iron Works	12, 13
Jeffrey Mfg. Co.	89		
		Walsh, J. T.	135
		Walsh, Richard P., Co.	140
		Ward LaFrance Truck Div.	14
		Weber Equipment Co.	129
		Weiss, B. M., Co.	141
		Western Precipitation Corp.	97
		Wayne, Roy C., Supply Co.	135
		Willifey, A. R., & Sons, Inc.	130
		Williams Patent Crusher & Pulv. Co., Inside Front Cover	
		Wisconsin Motor Corp.	127

RS

28
118
fig. &
18, 19
120
119
Inc. 137
125
37
k A. 140
Co.,
22
105
Corp. 70
Rope
125
27
122
38
Corp. 136
141
121
25
122
ment
135
y Co. 100
es Co. 126
achy.
117
8
103
133
135
D. Co. 125
144
g Co. 5
140
131
Co. 131
Works. 85
Wks. 134
17
orks. 118
15
70
46
ns Co. 41
77
123
ervice
134
g Co. 96
Inc. 95
69
73
orks. 91
136
136
136
108
g. Co. 6
44
83
ment
135
123
Works 31
59
ng Co.
& Mfg.
7
99
Inc. 132
re Co. 132
128
Corp. 79
reen
134
Son. 137
of
24
12, 13
135
Co. 140
Div. 14
Co. 128
141
Corp. 97
ly Co. 135
s. Inc. 130
er &
ont Cover
127

Dependable EUCLIDS

COST LESS TO OWN



On scores of big earth and rock moving jobs, and in industrial operations too, Rear-Dump and Bottom-Dump EUCLIDS are moving more yards and tons per hour at consistently lower cost. Carrying pay loads of 15 to 30 tons at speeds up to 33 m.p.h., EUCLIDS cut down the round trip time from the loading unit to dump and carry more pay loads per hour.

Designed and built throughout for the hard service of off-the-highway hauling, EUCLIDS actually cost less to own than ordinary hauling equipment. Lower operating and maintenance

cost, plus dependable trouble-free operation, has made Euclid the favorite equipment of contractors and industrial users for hauling all kinds of heavy excavation and materials.

If you need new equipment for a current job or are planning for your peace time requirements, be sure to consult your Euclid distributor or write us for descriptive literature.

The EUCLID ROAD MACHINERY Co.
Cleveland 17, Ohio



EUCLID

SELF-POWERED
HAULING EQUIPMENT

For EARTH ROCK COAL ORE





6 CONES SERVE THE KENTUCKY STONE COMPANY

There are two Symons
Cones in the crushing
plant at Russellville —
a 3 foot Short Head
and a 4 foot Standard.

IN the widespread operations of the Kentucky Stone Company, fine crushing at the various quarries of this company is being done with six Symons Cones of the 3 and 4 foot sizes in both Standard and Short Head types. Among the 3 foot Cones is an early built machine which has been in operation over eighteen years. That Symons Cones should continue to be chosen for fine crushing of the company's expanding operations is evidence of the satisfactory service which these crushers have given. This is one more of the many progressive producers of crushed materials that have continued to install Cones when increased output of more finely crushed products is required.



NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN

NEW YORK • LOS ANGELES • LONDON • TORONTO



SYMONS CONE CRUSHERS



regardless
of Job...

TRU-LAY HAS THE STAMINA

When it comes to efficient, economical, safe operation, American Cable **TRU-LAY PREFORMED WIRE ROPE** is without a peer. It is head and shoulders above any non-preformed rope because, being preformed, **TRU-LAY** is easier and safer to handle, is pre-broken-in, reeves faster. It resists kinking and whipping, requires no seizing when cut, splices and sockets easier and with greater dependability. American Cable **TRU-LAY** is the original preformed rope. Make certain your next line is **TRU-LAY PREFORMED**.

• Send today for a free copy of American Cable's 80-page, pocket-size book: "HOW TO KEEP YOUR WIRE ROPE WORKING." One of the most constructive books on wire rope maintenance ever published. A real help for your operators regardless of brand of rope now being used.



AMERICAN CABLE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma



AMERICAN CHAIN & CABLE • BRIDGEPORT



Accurately timed, efficient application of overwhelming force in the selected sector ... that's what brings the "break-throughs" that mean Victory on the fighting fronts ... It takes the same precise timing, the same concentration of maximum energy at the right spot to bring the shattering penetration that means economy in blast hole drilling. Bucyrus-Erie drills strike with a force timed to perfection; their snappy drilling action permits sharp, quick blows carrying the full weight of the tools so that every blow is of the smashing type that means outstanding footage. There's a hard hitting Bucyrus-Erie for every blast hole drilling need — 22-T, 27-T, 29-T, 42-T. Investigate them today.

H-53C

**BUCYRUS
ERIE**



SO. MILWAUKEE, WISCONSIN



